

**TRANSPORTATION
AND
ECONOMIC
OPPORTUNITY**

A report to the Transportation Administration of the City of New York by Regional Plan Association

NEW YORK CITY TRANSPORTATION ADMINISTRATION

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PART 1. CONCLUSIONS AND RECOMMENDATIONS

DIMENSIONS OF THE POVERTY AND MANPOWER PROBLEMS

With 1.2 million New York City residents receiving public assistance and a total of 2.5 million having less than an adequate "lower standard of living" income, as defined by U.S. Bureau of Labor Statistics, poverty is well recognized as the City's number one problem. Less well recognized is the fact that today, a greater proportion of the nation's poor live in New York City than ten or twenty years ago. Despite the anti-poverty efforts of the past decade, the lower third of the City's population is getting a somewhat smaller share of total income than it did before, while outside the City a more equal distribution of income occurred. Though the proportion of people with low skills in the City has not been decreasing as fast as in its environs, manual jobs in the City are being replaced by white collar jobs even faster than in the environs or in the nation. Before we see in what ways and how much transportation can help, the over-all magnitude of the poverty and manpower problems must be put in perspective.

It can be estimated that the City has, not counting unemployment due to business cycles, over 75,000 unemployed blue collar workers with low skills. In addition, some 170,000 potentially employable City residents with uncertain skills are not even registered as unemployed. Under good economic conditions, these people would be searching for only about 20,000 rather low-paying blue collar job openings in the City. Another 20,000 somewhat better paid ones outside the City could be available if City and suburban unemployment rates were equalized, and racial discrimination barriers lowered.

If trends of the recent past continued to 1985, an estimated prospective loss of 130,000 blue collar jobs from New York City would be only partially made up by the creation of 70,000 new service jobs. Blue collar opportunities for City residents outside the City would only rise from 20,000 to 40,000. And, even with an expected shrinkage of the unskilled labor pool, up to 250,000 City residents who have no white collar skills would still remain without jobs.

Meanwhile in white collar work there is no unemployment if one discounts the effect of business cycles and job turnover. By 1985, some 420,000 new white collar jobs could be expected to locate in the City. If recent trends in the occupational advancement of Blacks and Puerto Ricans continue, they will capture about 330,000 City white collar jobs left by suburbanizing whites, and some 130,000 out of the newly created jobs. Should commuting from the suburbs stay at the present level, this would still leave almost 300,000 white collar jobs in the City unfilled.

The danger in these divergent trends is two-fold:

1. With declining factory work and only a small increase in service jobs, the poor are increasingly barred from customary opportunities for employment.

2. With an increasing shortage of white collar skills in the City, the growth of its office industry could be jeopardized, depriving the poor of this major new opportunity for advancement.

Clearly the advancement of the City's disadvantaged population and the growth of the City's office industry must be tied together in the long run. Stepped up training for white collar skills, broader access to university education through open enrollment and a massive improvement in the quality of the public school system are essential for both. Stepped-up production of in-City housing attractive to white collar workers and improved transportation to office centers in the City also emerge as important, even if their relationship to poverty is indirect. A re-orientation of manpower training programs toward the acquisition of white collar skills, now partially underway, can alter the City's labor force profile and eliminate some white collar deficits which can otherwise be filled only by in-commutation. This will improve opportunities for City residents, but will solve the City's poverty problem only in part.

The magnitude of needed solutions

To bring the 2.5 million City residents who now live below an adequate "lower standard of living" up to this standard in 1971 would have required an income transfer of about \$2 billion, over and above the almost \$1.2 billion the City disbursed in welfare assistance. Administered as a "negative income tax" or any number of similar proposals, income transfer at this level would involve, nationwide, about 5 percent of the nation's money income. What impact can programs other than direct income support have on reducing this "income gap"? For the sake of illustration, several possibilities are scaled below; the relationship between their cost and their effectiveness varies, they are in part substitutes for each other, and the list is by no means exhaustive.

1. Matching the unemployed with existing jobs. If 20,000 blue collar job openings in the City and the more hypothetical 20,000 in its environs were filled by presently unemployed blue collar workers from the City, about 12 percent of the \$2 billion "poverty income gap" would be closed. It is true that many of these openings are near the minimum wage level, on which only a self-supporting single individual can live above a "lower level of living budget"; for a two or three person family, minimum legal wages from one worker produce only a marginal incentive for employment, compared to a welfare allowance. Still, given the

number of unemployed single individuals, and the presence of better paid jobs among the blue-collar openings, filling more of them is desirable and requires:

- a) a full-employment economy
- b) improved placement programs and better information on job availability by location
- c) improved access, particularly to the more distant opportunities outside the City.

2. Manpower training and support services. Apart from the preparation for semi-skilled occupations, which have been the target of most training programs in the past, three future opportunities are important, and could be realized over the next 15 years:

a) many semi-skilled and unskilled blue collar unemployed in the City could move up into skilled blue collar positions now held by commuters from the suburbs, if discrimination barriers in skilled trades and crafts were lowered. Equipping 30,000 lower skilled City residents with craft skills and placing them in such jobs would bridge about 11 percent of the "poverty income gap".

b) Many of those who now hold miscellaneous low-paying jobs could be trained for white collar occupations. The training involved is expensive, but should 100,000 trainees be placed in moderately skilled white collar positions at prevailing clerical wage rates, about 13 percent of the "poverty income gap" would be bridged by the added income.

c) Many mothers among the near-poor possess some white collar job experience and could obtain white collar jobs if day care services were provided for their children. Providing day care services for 85,000 children (in addition to the present 40,000, or 6.5 percent of the City's pre-school total) could free 50,000 mothers in low-income families for white collar jobs and cover, at prevailing clerical wage rates, about 17 percent of the "poverty income gap".

3. Job creation. The present economy of the City and the Region simply does not have the jobs to employ all those who could work but do not have or cannot acquire the skills that are in demand. In the poverty areas surveyed in this study 64 percent of the unemployed were not high school graduates, compared to only 30 percent of those employed, a fact that may only partially reflect unrealistically high entry requirements for some jobs. A program of public service jobs, creating presently non-existent low-skilled employment for, say, 50,000 individuals who are outside the labor force would fill, at minimum legal wage rates, about 10 percent of the "poverty income gap". By comparison, present job creation programs cover about 3,000 individuals.

4. Keeping blue-collar jobs close to City residents. The outmigration of manufacturing and warehousing from high density areas can be slowed somewhat and guided by not discouraging industries from staying in the City, and by positive steps, such as the City's Industrial Renewal Program. Blue collar employment losses projected in this report are based on the assumption that the latter program will succeed in keeping about 60,000 jobs in the City which would otherwise leave. Moreover, State and regional agencies should not be indifferent to industrial location patterns beyond City boundaries. Thus, development of the Hackensack Meadow lands in New Jersey stressing office buildings will be in competition with the City, whereas emphasis on manufacturing and warehousing would be complementary and would keep blue collar jobs within reach of City residents.

5. Locating residences closer to jobs. A lasting improvement in the access to job opportunities requires an improvement in the Region's housing mix, including more moderate and low-income units in the suburbs. Data from this report suggest that lower income housing for City residents near suburban job opportunities should be located on the average within two to three miles of industrial concentrations, at densities sufficient to support bus service (say more than 7 dwellings per residential acre), and primarily in the counties of Bergen, Westchester, Fairfield and Nassau. With a fixed amount of capital, about 1.4 housing units can be built in the suburbs for every one in the City due to the lower cost of low-rise housing. Based on prospective blue collar jobs to be filled over the next 15 years, 40,000 such low to moderate-income units should be built, over and above current suburban needs; the figure would increase to 130,000 if present moderate income out-commuters from the City were to find suburban housing.

It should be emphasized that some of the above points, namely, (2c), (4) and (5), will not in themselves create any new jobs, but largely shift the burden of the unemployment from falling unfairly on City residents. Without special efforts at skills upgrading and job creation, the New York - New Jersey - Connecticut Region as a whole will continue to have a serious surplus of unskilled manpower. Moreover, it is evident that even if such efforts are successful, increased direct income support will still be necessary to close the poverty income gap.

WHAT TRANSPORTATION CAN DO

It is apparent that many of these steps to improve economic opportunity do depend on the performance of the transportation system, its ability to get workers to the jobs and back home, as well as to employment agencies, training centers, or day-care services. However, accurate measures of the degree to which transportation can enhance economic opportunity turn out to be elusive, and a direct link between poor access to jobs and high unemployment rates is not easy to document in the New York Region.

The fact that unemployment in the lower-skilled blue collar occupations in the City is three times as high as outside the City does show that City residents are unable to compete effectively in the suburban job market. Discrimination and lack of knowledge about suburban job openings are partly at fault, but faster and cheaper access to the suburbs would help. Within the City, the picture is less clear. Differences in unemployment among the three low-income areas studied seem unrelated to job access. Out of some 2,400 low income residents interviewed who were not working, only one gave "bad transportation" as the reason. The 1970 Census also found a fraction of one percent. In fact, bad transportation may be causing considerably more unemployment, but the unemployed themselves have no way of knowing it. Polytechnic Institute of Brooklyn estimated that perhaps 15 percent of the unemployed were out of work because of inadequate transportation in the Brooklyn Model Cities area.

The relationship between economic status and access to job opportunities is even more complex. Not only do the poor in New York City on the average live closer to the subway than the well-to-do, but within the poor areas income tends to be lower where transit access to jobs is better. Similarly, throughout

the Region wages paid by manufacturers tend to be lower in areas close to subway stations, or in those more accessible by railroad or bus. Probably as a result of these lower wages, plants near transit lines also tend to have more vacancies, and report greater recruiting difficulties than plants in auto-oriented territory. These patterns largely reflect the history of the Region's economic development: an older and less desirable housing stock near transit lines and manufacturing districts, as well as more labor-intensive and less efficient plants in the older districts near transit lines.

Generally, transportation service in the Region being fairly ubiquitous, the kinds of problems low-income area residents complained most about in a questionnaire for this study were not necessarily problems particular to their areas but rather characteristic of the system as a whole--such as that the trip "costs too much", is "too crowded", takes "too long", and is "too dirty"--in that order. Similarly, in a questionnaire addressed to employers, the only response that elicited a clear majority (almost 60 percent in New York City compared to only 36 percent outside the City) was that the unreliability of transit results in frequent lateness of employees--again a condition pertaining to the system as a whole.

The location of job training centers was also looked at in this study, and it was found that they are generally well served by the public transportation system, and accessible to their target populations.

The three principal places of employment opportunity for low-income City residents were found to rank as follows, in order of importance:

1. Employment concentrations in or near the low-income areas themselves.

In the three study areas surveyed during this project, 50 percent of the workers worked in the same borough in which they lived. This emphasizes the importance of local transportation within low-income areas and in their close vicinity. Such local trips to work are predominantly by automobile (43 percent in the three study areas) and by bus (31 percent in the three study areas). Walking and the subway account for the remainder.

2. The Manhattan Central Business District. Despite declines in production-oriented employment, the CBD still has 560,000 blue collar jobs, almost half the City's total. It is the major job location for Harlem, employing 66 percent of its low-income workers, and it attracts 25 to 40 percent of the workers living in low-income areas in other boroughs. Most of these work trips to the CBD are made by subway. This underscores that even though low income residents are less likely to work in Manhattan and to use the subway than middle-income residents, they still would benefit very substantially from subway improvements aimed at Manhattan.

3. Dispersed employment locations in other City boroughs and in nearby suburban counties. Together, these account for about 20 percent of the jobs of low-income area residents (the proportion of those working in the suburban counties varies from 2 to 10 percent). Work trips to other boroughs are made predominantly by subway, but over 80 percent of those to the suburban counties are by auto with very few trips by bus and railroad. The suburban opportunities will increase moderately in the future: this does suggest limited possibilities for expanding bus and rail use for some longer distance trips if fares for reverse com-

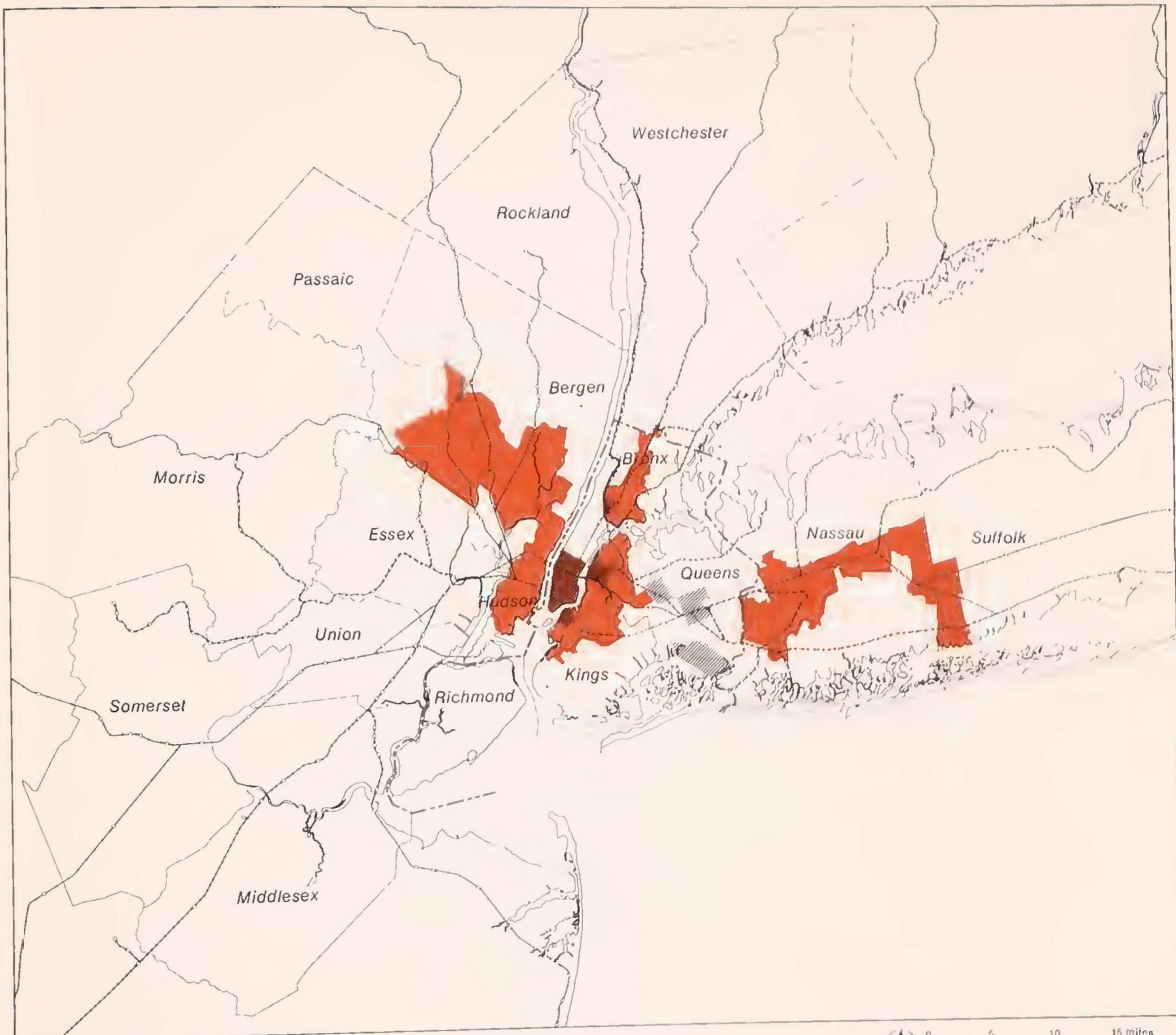
muting are sufficiently reduced, but most of the increase will have to be by auto because of the dispersed nature of destinations. The major opportunity areas for low-income employment are shown on Map 1, and the estimated present journey-to-work streams from three major low-income areas on Map 2.

The three target employment concentrations in New York City shown on Map 1, namely the Manhattan central business district, the East River industrial band, and the south-central Bronx would have, under conditions of full employment, about 15,000 semi-skilled and unskilled blue collar job openings, about 75 percent of the City's total. The two suburban areas in central Nassau County and inner New Jersey would have about 4,100 or some 20 percent of the total in 12 suburban counties outside Connecticut. All suburban openings at this skill level can be estimated to be distributed as follows: 70 percent in New Jersey, 20 percent on Long Island, and 10 percent in the Region's northern sector of New York State. Map 1 also shows, with crosshatching, major opportunity areas for lower skilled white collar and service work.

The estimated journey-to-work streams from low-income areas, shown on Map 2, graphically indicate that people with modest incomes do not travel far. Data from the 1960 Census, from the 1963 Tri-State Regional Planning Commission Home Interview Survey, and from our own 1970 interviews in the three study areas consistently show: the lower the income, the shorter on the average, the journey to work. This is mainly due to the pattern of low-income job locations, which tend to be close to places of residence, and to the generally higher cost of the longer trips. One cannot solve low-skilled manpower problems by large increases in long-distance commuting; however, making some longer trips possible will expand opportunities.

Another significant finding of this study is that to a greater extent than is commonly thought, lower-income areas depend on the automobile for travel to work. In the three study areas investigated, 40 percent travelled to work by auto, 35 percent by subway and 16 percent by bus. Those travelling by auto went 20 to 50 percent faster, and held better paid jobs, even when the auto was not their own. Automobile use for travel to work in 1970 was higher than that recorded by the 1960 Census, despite the fact that auto ownership in these areas remained essentially static. In New York City factories outside Manhattan, this study found 44 percent of the workers arriving by auto. Of course, both in the study areas, selected because of their poor access to the subway, and in factories, auto use is higher than in low-income areas on the average. Data from the 1970 Census, released after the completion of this study, show an average of 20 percent of all workers from the low income areas of Brooklyn, Queens and the Bronx travelling to work by auto.

Still, it is necessary to abandon the notion that restricting auto use hurts only the well-to-do. Blanket policies directed against the auto as such do hurt the low-income worker. Therefore, policies for managing auto travel must be selective, discouraging it when the car is in the wrong use (i.e. auto travel to the Central Business District, where pollution concentration is high, and where the alternative of transit exists), and at the same time protecting the interests of the poor (i.e. auto travel to otherwise fairly inaccessible factory sites, where the auto may have a negligible impact on the environment because of low density).



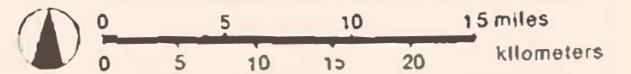
Map 1.
Opportunity Areas for Low-Income Employment in New York City and Environs.

- Selected concentrations of blue collar jobs
- Selected concentrations of clerical and service jobs
- Railroads





Map 2.
Low-Income Areas in New York City and Their Major Travel Corridors



■ Low-income areas

— Expressways

Daily trips by workers earning less than \$5,000 annually in 1960:



Summarizing, transportation can: (1) open new job opportunities by permitting journeys which are now infeasible, (2) widen somewhat the range of choice among job opportunities, and (3) simply improve the conditions of life in low-income areas by making transportation services better, faster, less expensive or less damaging to the environment. To attain some of these objectives, five types of recommendations are set forth:

1. Bus route extensions, mergers and new routes providing access from low income areas to nearby employment concentrations. In line with its findings, this study avoids recommending long, single-purpose bus routes into new territory. These generally require very high subsidies because the low-income worker can pay only a small fraction of their cost, and off-peak riders are seldom available to carry part of the operation. Over time, their patronage shrinks as workers with newly found jobs acquire autos of their own. In the New York area, where an extensive bus system is in being, broadening its reach by minor route extensions promises greater benefits.

2. Selected free transfers among bus routes serving major low-income areas. Recommendations concerning a general fare policy on the transit system are outside the scope of this study, but it does make clear that a 35¢ fare, which amounts to some 4.5 percent of the low income worker's wages for a round trip becomes barely tolerable if it has to be paid twice, especially for a short trip. Selective expansion of free transfer privileges among bus routes is recommended to improve the responsiveness of the bus network to the short, intra-neighborhood trip important in low income areas. Free transfers from bus to subway are not recommended, since the majority of those paying this kind of a double fare are residents who are not poor and whose long trips cost the system more than the average one-fare trip.

3. Reduced commutation fares on suburban railroads in the reverse direction from stations in low-income areas, and added stops on some trains. To satisfy the need for access to employment opportunities in the suburbs, and to fill presently empty seats on suburban trains travelling in the reverse direction during peak hours, adjustments to the fare structure are recommended. However, prospective numbers of low-income users of the suburban railroad in the reverse direction are expected to be modest.

4. Greater emphasis on the needs of low-income areas in current subway planning, design and construction. An overall evaluation of priorities is outside the scope of this study, but three needs are apparent: a) advancement of the Southeast Queens extension so as to minimize environmental damage, b) advancement of the Canarsie line extension so as to remove elevated trackage and obviate the much more costly Utica Avenue subway construction; also, a new transfer station from the Jamaica BMT to the crosstown IND line in Bushwick, c) a review of Bronx subway planning so as not to bypass the Model Cities area and to enhance its potential for renewal.

5. Steps to facilitate automobile use by low-income workers who have no reasonable alternative for access to jobs. The auto represents by far the most effective transportation for breaking out of the ghetto, not only for access to better paying suburban job opportunities, but also for a variety of other needs which require access throughout the Region, and not only within its high-density core.

The recommendations of this report are focused on three study areas investigated in depth because their access to the subway system and their poverty indicators are worse than average: South Jamaica, Bushwick and East Tremont. However, the recommendations are extended, where logical, to affect all of the Model Cities areas of the South Bronx, Central Brooklyn, and a part of Harlem. These wider recommendations do not pretend to be a comprehensive plan, but they do dovetail closely with studies of these areas by others; some of the recommendations affect City- and Region-wide policies.

Bus route extensions, mergers and new routes

The City of New York is served by a rather dense grid of bus routes, covering most of its residential and commercial areas. However, important clusters of employment, mostly manufacturing plants, are located on the edge or just outside these areas, and receive only scanty bus service, mostly because the travel demand--limited to peak-hour work trips--does not justify a full-time bus route with frequent runs. To cover this deficiency, a total of 15 bus route extensions, branches, or new routes are recommended, many of them on a rush-hour-only basis. In addition to these, listed later in Table A, several minor extensions and adjustments are proposed, as well as some route mergers to create a one-fare service without transfers. These are discussed below by study area.

South Jamaica. In South Jamaica, bus service is characterized by a series of lines running north-south, feeding the rapid transit lines on Hillside and Jamaica Avenues and serving the retail concentration in Jamaica Center. Because these routes and those running east-west from other areas terminate in or near Jamaica Center and are operated by six different companies, each franchised over a different sector, the availability of direct bus service through Jamaica Center to points in Queens to the east, north and west is limited. To overcome this, Coverdale and Colpitts* has recommended the merger of twelve bus routes into six from 9 AM to 4 PM, each to run through Jamaica Center rather than terminating there; three of the six routes would result from merging routes of the same operator; some of them, including one serving College Point, would be cut back.

In planning such a merger of routes, two considerations must be kept in mind. First, in the case of route combinations of different operators, it is difficult to make the merger equitable; the operator who allows a high-density route to be shared by an operator with a lower-density route would be short-changed. Transfer payments would have to be devised to redistribute revenues. Second, the routes to be merged should have similar headways, so that an "averaging" of service does not result, with the high-frequency route losing service and the low-frequency route having more buses than the traffic can support. Furthermore, the limited hours recommended by the Coverdale report would not help journeys to work--the main consideration of this study--and cutting back Queens Transit route 25/34, which serves the manufacturing cluster at College Point, slated for expansion, would prevent access to it from South Jamaica.

* Coverdale and Colpitts, Report on Bus Transit System in Borough of Queens, New York, January 1971.

It is thus recommended that a number of route combinations by the same operator be instituted first on a trial basis, and should they be successful, point the way toward additional mergers. The trial mergers should serve the four major flows of South Jamaica traffic which now pay two fares, as shown in Map 25 in the text: Hillside Avenue east, Jamaica Avenue east, Jamaica Avenue west and Metropolitan Avenue toward Brooklyn. Hillside Avenue east would be served by merging Transit Authority routes Q-1 and Q-5, Jamaica Avenue west would be served by merging Transit Authority routes Q-4 and B-56, Metropolitan Avenue would be served by merging Transit Authority routes Q-4A and B-53, and finally Jamaica Avenue east would be served by merging Jamaica Buses routes 110 and 111/113. Each of these four pairs has similar service frequencies. To properly serve the job-holder as well as the mid-day traveler, the mergers should be in effect the entire day. The combined routes are shown on Map 3.

A major transportation problem in South Jamaica is the difficulty of reaching JFK International Airport by public transportation. Some 2,500 airport employees live in the area south of Hillside Avenue and east of the Van Wyck Expressway, but depend overwhelmingly on the automobile for access. The bus trip is so circuitous that it requires up to an hour of travel for an airline distance of less than four miles.

One step to reduce this difficulty would be relatively small extensions or modifications of existing bus routes. The Central Terminal Area and the Federal Circle near the main entrance of the airport can be served by extending the Green Bus line # 40, which presently terminates just two blocks from the entrance to the Van Wyck Expressway, into the airport. However, these are by no means the only concentrated work locations at the airport; the cargo area to the north and the maintenance area to the south are also important. Jamaica Buses # 111/113 route could be extended beyond its present southern terminus at Rockaway Boulevard near Farmer's Boulevard into the cargo area via a public road running just inside the north edge of the airport boundary. Additional traffic to the cargo area could be handled by Transit Authority Q-3 serving southeast Queens by extending it into the airport in the same manner.

Since each of these recommended extensions serves a different section of South Jamaica and none serve all major employment clusters at the airport, a free shuttle bus system connecting them would be necessary. The Port Authority of New York and New Jersey operates various free shuttle services at JFK Airport now, for both passengers and employees, and a revision in their routing and scheduling may achieve this objective.

Alternatively, the difficulty of serving all employment clusters at JFK Airport by fixed-route buses from the relatively low density areas of Southeast Queens may lead to a demand-actuated Dial-A-Ride service. Such services have been experimented with in several cities in the United States and Canada. They involve the operation of 10 to 20 passenger vehicles which respond to the specific origins and destinations of each traveller and to the time of day when he makes his trip, frequently on a subscription basis. The around-the-clock schedule of airport shifts would lead to a high utilization of such vehicles, and the relatively short distances involved would tend to keep the cost down. The potential which appears to exist for the transport of employees and others between South Jamaica



Map 3.
Proposed Bus Improvements in Jamaica

- Existing bus routes to be merged or extended
- - - Proposed extensions and additions
- Proposed free transfers
- Major nearby job concentrations



and airport locations warrants careful study of the Dial-A-Ride possibility by the airport operator directly, or through another interested agency, such as the newly formed Council on Airport Opportunity.

In the South Jamaica community, strong sentiment also persists for restoring crosstown bus service on Linden Boulevard, from the IND subway terminus at Lefferts Boulevard and 119th Street to St. Albans Hospital in Jamaica. At present, no other east-west route exists in South Jamaica. This line, started as a free community service by Dr. Thomas Mathews and later taken over by the Transit Authority was discontinued because of very sparse use--partly the result of misplaced terminal points and lack of free transfers to intersecting lines. Correction of these deficiencies would increase its use, even if it would not make it self-supporting. Also, in the future realignment of bus routes, attention must be paid to new housing sites under development in South Jamaica.

Bushwick and environs. In Bushwick, the greatest failing of the bus route layout is the lack of direct service to the nearby industrial concentrations in Maspeth, Sunnyside and Greenpoint. Because of the existence of several operators, the Transit Authority in Brooklyn and three operators in the parts of Queens adjacent to Brooklyn, bus service between the two boroughs is relatively uncoordinated: routes connecting them are not as plentiful as proximity would suggest. Bus route branchings and extensions are recommended to penetrate the industrial areas.

The Transit Authority's DeKalb Avenue B-38 route should be extended beyond its present terminus at Grandview Avenue and Stanhope Street to Maspeth and Sunnyside via Flushing Avenue, Rust Street, 56th Road, and Greenpoint Avenue terminating at Van Dam Street and Queens Boulevard. This will make some 40,000 blue collar industrial jobs accessible to large portions of Bushwick and the other Central Brooklyn poverty areas via one-bus service and combined with the free transfers, both existing and proposed, provide one-fare service to virtually all poverty areas of Central Brooklyn. The diversion of at least one-third of the peak period buses of the Transit Authority's Wilson Avenue B-60 route along Morgan Avenue to Greenpoint Avenue will provide Bushwick residents with one-bus service with twelve-minute headways to major portions of the industrial sectors of Greenpoint-Newtown Creek, containing some 50,000 blue-collar-industry jobs, many now beyond walking distance of the subway. Combined with existing and recommended transfers, this adjustment would give much of Central Brooklyn one-fare service to Greenpoint-Newtown Creek.

As an improvement within the Bushwick area, the need to expedite movement on the B-60 route along Wilson Avenue was brought out by the Bushwick community. Traffic on this narrow two-way street is frequently stalled. To correct this, Wilson Avenue and one of the parallel streets, either Central or Kniekerbocker Avenue, should be converted to one-way operation, and the bus route split accordingly to operate in a pair of one-way streets. All of these proposals are shown on Map 4.

East Tremont and the South Bronx. In East Tremont, the recommendations for changes in bus routes cover access by bus from a wider area, including most of the South Bronx and parts of Harlem, where there are several opportunities to adjust and extend existing routes and add new ones to give more direct service to industrial concentrations.



Map 4.
Proposed Bus Improvements in Bushwick

- Existing bus routes to be extended
- - Proposed extensions or new routes
- Proposed free transfers
- Major nearby job concentrations



Presently, only the Bx-34 serves Hunt's Point, but three Cross-Bronx routes, the Bx-11, Bx-30, and Bx-35, have their eastern termini near the base of Hunt's Point. The Bx-11 and Bx-35 should be extended to Southern Boulevard and Hunt's Point Avenue to connect with the Bx-34, and the Bx-30 should be extended into Hunt's Point via Leggett Avenue, making some 14,000 blue-collar-industry jobs accessible by bus from most of the low income areas in the Bronx.

The South Bronx industrial area, with 16,000 blue-collar-industry jobs, is served by a number of north-south routes but lacks an east-west route to distribute the north-south traffic. By extending Bx-3 across Bruckner Boulevard from Jackson Avenue westward to Lincoln Avenue and then north to 138th Street, seven north-south routes could be intercepted, providing one-fare service to the South Bronx industrial area for almost all of the South and Central Bronx poverty areas. The Bx-3 presently passes through the heart of this poverty area via Crotona, Prospect and Jackson Avenues and all those within walking distance could have one-bus service to South Bronx industrial jobs. Harlem residents would also make use of this route using Bx-29 across 125th Street and Bx-33 across 138th Street and transferring in the Bronx for this extended Bx-3, the east-west distributor.

The jobs at La Guardia Airport and in Astoria can be made more accessible by providing a service from Harlem, across 125th Street, starting at least as far west as Lenox Avenue, but preferably on Broadway, to connect to west side subways. At Park Avenue, air travellers who use the Penn Central Railroad could add to the bus ridership. The route would make one additional stop at Astoria Plaza, connecting with the BMT subway there and then run express via the Grand Central Parkway directly to La Guardia. This would be an extension of the existing TB bus route.

East Harlem and most of the poverty areas in the Bronx have very poor access to the George Washington Bridge Bus Station (GWBBS) in Washington Heights, requiring a two or three-legged subway ride or a long and slow local bus ride to reach it. By extending several bus routes onto the limited access highway system, quick direct service can be established. MABSTOA's M-1 service on Fifth and Madison Avenues should be extended beyond its present northern terminus via Harlem River Drive to the GWBBS. Entrance to the Drive would be at 139th Street and Fifth Avenue and on the return trip buses could exit at 142nd Street and Fifth Avenue. The Transit Authority's First and Second Avenue route, the M-15 should also be extended north on the Harlem River Drive beyond its present terminus at 126th Street. Its entrance and exit ramps would be at 127th Street and Second Avenue. In the Bronx, the extended Bx-3 should be extended still further across 135th Street to the Madison Avenue Bridge and into the Drive at 139th Street. All three routes would connect to the GWBBS using the Amsterdam Avenue and 178th Street exit of the Harlem River Drive, giving direct and fast bus service to all of East Harlem and much of Central Harlem, the South and Central Bronx. In addition, as a minimum improvement, five bus routes which presently stop at 180th Street and Broadway should be extended to the entrance of the GWBBS at 178th Street and Broadway to facilitate transfers. It may also be possible to use the Cross Bronx Expressway to provide access for Central Bronx residents via a new route. However, such service probably would be attractive only before 7:30 AM in the westbound direction because of congestion on the expressway. Given these improvements, at least 500 new peak period passengers from East Harlem and the Bronx to the GWBBS could be expected.



Map 5.
Proposed Bus Improvements in The Bronx

- Existing bus routes to be extended
- - - Proposed extensions or new routes
- Proposed free transfers
- Major nearby job concentrations



Of course, improving access to the GWBBS is not particularly fruitful for the journey to work by blue collar workers unless the bus service into New Jersey serves the appropriate industrial areas. At present, there is no service by bus from the GWBBS to the industrial concentrations of the more than 25,000 jobs in South Hackensack, Teterboro, Moonachie and Carlstadt, about half in the category of operatives and laborers. By contrast, the Port Authority Bus Terminal (PABT) offers frequent service via Manhattan Transit # 51 resulting in 591 workers using it for reverse commuting. Since total reverse commuting from the GWBBS is roughly half what it is from the PABT, it is not unreasonable to assume that equivalent bus service from the GWBBS to these four municipalities could generate upwards of 300 trips, roughly half the PABT total. It is therefore recommended that an express route using Interstate 80 be set up, exiting at Green Street in South Hackensack and continuing on Huyler Road, North Street, Industrial Road and Moonachie Road, terminating at Paterson Plank and Moonachie Roads. With further industrial development in the Hackensack Meadowlands, other routes of a similar type could be added in the future. For many Bronx and Harlem residents, a trip from the GWBBS will be a much shorter one than from Midtown Manhattan. These bus improvements are shown on Map 5.

Table A summarizes the estimated cost of the major proposed bus recommendations involving route extensions and branchings. Though the average speed of local City buses outside Manhattan is about 7.5 mph, the higher average speed of 10 mph is assumed because of less street congestion in the peripheral industrial areas. Still higher speeds are assumed on the route segments proposed for expressway operation. The hourly bus operation cost is taken as \$15; the assumed service frequencies vary, as indicated in the Table; a new bus is assumed to cost \$40,000 with a useful life of 10 years, or \$6,000 annually at 6% interest.

Table A.
Estimated Annual Costs of Bus Recommendations.

Route	Route Miles	Peak Headways (Min.)	Round Trips/day	Operating	Annual costs Equipment	Total
1. Green Bus #40	2.5	3	166	\$186,700	\$ 60,000	\$ 246,700
2. Jamaica Buses 111/113 ^{a, b}	1.7	5	20	-54,000 ^c	0	54,000
3. Q3 ^a	1.3	20	17	16,600	6,000	22,600
4. Linden Boulevard	3.8	15	55	188,100	24,000	212,100
5. B38 ^{a, b}	3.4	12	20	51,000	24,000	75,000
6. B60 ^{a, b}	1.9	12	20	10,500	0	10,500
7. Bx11 ^a	0.7	4	48	30,200	18,000	48,200
8. Bx35 ^a	0.4	4	48	17,300	12,000	29,300
9. Bx30 ^{a, b}	1.3	9	24	23,400	12,000	35,400
10. Bx3 (across Bruckner Blvd.) ^a	2.3	4	60	103,500	48,000	151,500
11. Bx3 (to GWBBS) ^{a, b}	4.5	12	20	27,000	12,000	39,000
12. TB	3.8	12	34	114,000	24,000	138,000
13. MI ^b	2.3	12	12	59,600	6,000	65,600
14. M15 ^b	3.0	3	153	165,200	36,000	201,200
15. GWBBS I-80 route ^a	12.3	15	16	36,900	0	36,900
Total	45.2		773	\$976,000	\$282,000	\$1,258,000

^a Peak hours only

^b One in three existing buses

^c Annual Savings

Note: Excludes recommended minor route extensions near the GWBBS and route mergers in Jamaica

Source: Regional Plan Association

To hold down the costs, ten of the fifteen recommendations would be in effect during peak hours only. Furthermore, seven of the recommendations involve the extension or branching of only one in every three existing runs. Also, the costs of the two recommendations for branching routes B60 and Jamaica 111/113 would be lowered by the savings realized from reduced operation on the existing route. The total annual operating cost of meeting these recommendations would be \$976,000, plus \$282,000 for equipment. These, of course, would be at least in part recovered by revenues from the additional services offered. While patronage estimates for most of the lines are difficult to develop, the proposed GWBBS-I-80 route would break even with a 50¢ one-way fare, if the assumed patronage estimate of 300 passengers is realized.

The success of these route changes is in part predicated on an adequate information program, including route maps and schedules at every bus stop, borough-wide bus maps at important locations, and general publicity.

Free transfers among buses in low-income areas

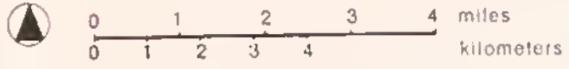
The recommended bus route extensions and branchings will improve access to areas of blue-collar employment, but mostly for workers living along these routes. Since it is impossible to provide a bus route from every conceivable origin to every destination, transfers among bus lines must be an essential part of the system. They are particularly important for access not only to jobs, but also to training, education, health and social facilities, as well as to shopping areas, which are located within the low-income neighborhoods.

Today, the usefulness and flexibility of the City's bus network for most of these intra-neighborhood trips is severely restricted by the scarcity of free transfers among routes. If the path of one's trip does not coincide with that of a particular bus route, and one has to change buses, the cost of the trip may double or triple. The pattern of free transfers among bus lines in the City is extremely haphazard. Map 6 shows all locations where at least one of the transfer movements is free. Brooklyn has a generous number of free transfers, and Queens has some. The fact that there are nine bus companies in Queens, none providing free transfers to any of the others, partly explains the pattern in that borough. But even in Brooklyn, where almost all routes belong to one operator, the Transit Authority, the pattern of free transfers is haphazard, reflecting largely past ownership and practices of long-defunct streetcar lines. Some routes crossing one another have no transfers, some have partial transfers only in a specified direction, and still others have complete free transfer rights. Both these boroughs are far better off than the Bronx, where no free transfers exist, or Manhattan, where only a few exist. The Manhattan and Bronx Surface Transit Operating Authority (MABSTOA, a Transit Authority subsidiary), the major operator in these two boroughs, is the only one of significant size in the City which has a policy of no free transfers, inherited from its private predecessors. A more equitable City-wide free transfer system is clearly in order, and has been a topic of discussion for some time.

The main obstacle to it has been one of cost. On Transit Authority bus routes, 11.8 percent of the passengers are estimated to use free transfers, and another 18.4 percent pay double fares. On MABSTOA routes, 24.4 percent pay

Map 6.
Existing Free Transfers on
the Bus System

- Bus routes
- Free transfers within New York City



double fares. If one includes the private bus lines, City-wide elimination of two-fare bus trips would cost an estimated \$60 million a year, at 1972 fare levels.

Various outside subsidies to cover this cost in whole or in part are conceivable; if spread among all present bus users, the bus fare would have to be raised from 35 to 42 cents. Alternatively, keeping the 35¢ fare, introducing a uniform City-wide 10¢ paid transfer between buses, and eliminating present free transfers, would result in a \$35 million annual cost. The uniform City-wide 10¢ transfer would save money for South Jamaica and Bronx residents, whereas those of Bushwick would pay, in the aggregate, roughly what they pay now. Of course, most of the \$35 million subsidy would go to residents of areas which are not poor.

Focusing on poverty areas, this study found double-fare bus trips to account for 32 percent of all bus trips to work in South Jamaica, 30 percent in East Tremont, and 15 percent in Bushwick. Double-fare bus trips may be more prevalent for journeys to work than for other types of trips, but it does appear that poverty area residents in the Bronx and Queens suffer more than average residents from the incidence of double fares. Bushwick is better off, because existing free transfers in Brooklyn tend to be clustered in and around the low-income areas of Central Brooklyn. Still, even if only one in seven riders pays close to 10 percent of his daily income for a two-fare bus round trip, it is a severe hardship in low-income areas, where buses are a major means of public transportation not only for short trips to work, but for all kinds of purposes within the neighborhood. On that basis, while system-wide free transfers ought to be a goal, the immediate expansion of free transfer privileges at all intersections of bus routes in central parts of low-income areas is recommended. The cost of this limited program, outlined below, is estimated at between \$12 and \$15 million annually, almost half of it attributable to the Bronx.

South Jamaica. Residents of this study area traveling to most places in Queens beyond Jamaica Center must now pay two fares. A system of free transfers among all routes, including those of separate carriers serving Jamaica Center within an area bounded by Hillside Avenue to the north, Sutphin Boulevard to the west, South Road and Liberty Avenue to the south and 170th Street to the east should be adopted to provide one-fare service for local movements not covered by route mergers recommended earlier in this report. This involves a total of 180 free transfers which are listed in Table B and located earlier on Map 3.

Bushwick and Central Brooklyn. In their study of transportation needs in the Model Cities area of Central Brooklyn, Polytechnic Institute of Brooklyn* proposed the creation of 57 free transfers among bus routes in and near the study area in addition to those already existing. This report supports all these and in addition recommends 33 free transfers in and near Bushwick not covered by the Polytechnic study. Taken together these recommendations create 90 free transfers for movements between all bus routes in the low-income areas of Central Brooklyn, and insure one-fare service to industrial concentrations nearby.

* Transportation Needs of Residents, Central Brooklyn Model Cities, April 1971, Polytechnic Institute of Brooklyn.

Table B.
Recommended Free Transfers for South Jamaica Residents.

Route #	Name	With:
Q 1	Hillside Avenue	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q42, Q44
Q 2	Hillside Avenue-Hollis	Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q42, Q44
Q 3	Jamaica-Hollis	Q17A, Q31, Q42, Q43, Q44
Q 3A	Jamaica-114th Avenue	Q1, Q4, Q4A, Q5, Q5A, Q5AB, Q17, Q36, Q43, Q44, B22, B53, B56, J110, J111/113, J112, QT 25/34, QT 65
Q 4	Jamaica-Cambria Heights	Q1, Q2, Q3A, Q17, Q36, Q42, Q43, B53, B56, J110
Q 4A	Merrick Boulevard-St. Albans	Q1, Q2, Q3A, Q17, Q36, Q42, Q43, B53, B56, J110
Q 5	Merrick Boulevard	Q1, Q2, Q3A, Q17, Q36, Q42, Q43, B53, B56, J110
Q 5A	Merrick Boulevard-Rosedale	Q1, Q2, Q3A, Q17, Q36
Q 5AB	Bedell Street	Q42, Q43, B53, B56, J110
Q 17	Flushing-188th Street, Jamaica	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q42
Q 17A	Horace Harding Boulevard	Q1, Q2, Q3, Q36, Q42, B53, B56, J110
Q 31	Bayside West Jamaica Conn.	Q1, Q2, Q3, Q36, Q42, Q43, B53, B56, J110
Q 36	Hillside-Jamaica Ave.	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q42, Q44
Q 42	177th Street	Q1, Q2, Q3, Q4, Q4A, Q5, Q5A, Q5AB, Q17, Q17A, Q31, Q36, Q43, J110
Q 43	Hillside-City Line	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q31, Q42, B22, B53, B56, G6, G8, G9, G40, G41, G60, J110, J111/113, QT25/34, QT65
Q 44	Bronx-Jamaica	Q1, Q2, Q3, Q3A, Q36, B22, B53, B56, G6, G8, G9, G40, G41, J110, J111/113, J112, QT25/34, QT65
B 22	Parsons Boulevard	Q3A, Q43, Q44, G6, G8, G9, G40, G41, G60, J110, J111/113, J112, QT25/34, QT65
B 53	Metropolitan Avenue	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q43, Q44, G6, G8, G9, G40, G41, G60, J110, J111/113, J112, QT25/34, QT65
B 56	Jamaica Avenue	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q43, Q44, G6, G8, G9, G40, G41, G60, J110, J111/113, J112, QT25/34, QT65
G 6	Sutphin Boulevard	Q43, Q44, B22, B53, B56, G9, J110, J111/113, J112, QT25/34, QT65
G 8	101st Avenue	Q43, Q44, B22, B53, B56, J110, J111/113, J112, QT25/34, QT65
G 9	Lincoln Street	Q43, Q44, B22, B53, B56, G6, J110, J111/113, J112, QT25/34, QT65
G 40	142nd Street	Q43, Q44, B22, B53, B56, J112
G 41	Jamaica-Lindenwood	Q43, Q44, B22, B53, B56, J110, J111/113, J112, QT25/34, QT65
G 60	Queens Boulevard	Q43, B22, B53, B56, J112
J 110	Jamaica Avenue	Q3A, Q4, Q4A, Q5, Q5A, Q5AB, Q17A, Q31, Q42, Q43, Q44, B22, B53, B56, G6, G8, G9, G41, QT25/34, QT65
J 111/113	New York Boulevard	Q3A, Q43, Q44, B22, B53, B56, G6, G8, G9, G41, QT25/34, QT65
J 112	Liberty Avenue	Q3A, Q44, B22, B53, B56, G6, G8, G9, G40, G41, G60, QT25/34, QT65
QT 25/34		Q3A, Q43, Q44, B22, B53, B56, G6, G8, G9, G41, J110, J111/113, J112
QT 65		Q3A, Q43, Q44, B22, B53, B56, G6, G8, G9, G41, J110, J111/113, J112

Total: 180 transfer pairs

Table C.
Recommended Free Transfers for Brooklyn Residents

Regional Plan recommendations:		
Route #	Name	With:
B 7	Kings Highway-Saratoga Avenue	B 26*
B 10	New Lots Avenue	B 54
B 13	Crescent Street	B 26, 38, 52, 54
B 18	Cypress Avenue	B 26, 28, 52, 55, 56, 58
B 20	Decatur Street	B 56, 60
B 22	Atlantic Avenue	B 26, 52
B 24/29	Greenpoint Avenue	B 60*
B 26	Putnam Avenue	B 7*, 13, 18, 22, 52, 54, 55, 58, 60
B 38	DeKalb Avenue	B 13, 18, 52, 53**, 54, 55, 58
B 40	Ralph Avenue	B 52, 54
B 46	Utica Avenue	B 54
B 47	Tompkins Avenue	B 54
B 48	Lorimer Street	B 54
B 52	Gates Avenue	B 13, 18, 22, 26, 38, 40, 54, 55, 58, 60
B 53	Metropolitan Avenue	B 38**
B 54	Myrtle Avenue	B 10, 13, 26, 38, 40, 46, 47, 48, 52, 55, 58, 60*, 61, 69
B 55	Richmond Hill	B 18, 26, 38, 52, 54, 58
B 56	Jamaica Avenue	B 18, 20
B 58	Corona Avenue	B 18, 26, 38, 52, 54, 55
B 60	Wilson Avenue	B 20, 24/29*, 26, 52, 54*, 62
B 61	Crosstown	B 54
B 62	Graham Avenue	B 60
B 69	Vanderbilt Avenue	B 54

Polytechnic Institute of Brooklyn recommends 57 free transfer pairs 10 of which are duplicated in the list above.

Total: 90 transfer pairs

* Partial free transfers exists

** If B-38 extended

Table D.
Recommended Free Transfers for Bronx Residents

Route #	Name	With:
Bx 1	Concourse-138th Street	Bx 30,33
Bx 2	Concourse-Hub	Bx 25, 26, 28, 30, 34, 41, 42
Bx 3	Prospect Avenue	Bx 11, 26, 28, 30, 31, 33, 34, 35, 36, 40, 42
Bx 5	Bruckner Boulevard	Bx 31, 34
Bx 11	170th Street Crosstown	Bx 3, 25, 26, 29, 31, 41
Bx 20	Bronx-Van Cortland & Park	Bx 26, 28, 31, 36, 40
Bx 25	Morris and Jerome Avenues	Bx 2, 11, 26, 29, 30, 33, 34, 35, 41
Bx 26	Boston Road	Bx 2, 3, 11, 20, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 40, 41, 42
Bx 28	Williamsbridge	Bx 3, 20, 25, 29, 31, 36, 40, 41
Bx 29	Willis Avenue	Bx 2, 11, 25, 26, 28, 30, 32, 33, 34, 35, 36, 40, 41, 42
Bx 30	149th Street Crosstown	Bx 1, 2, 3, 25, 26, 29, 31, 32, 41, 42
Bx 31	Southern Boulevard	Bx 3, 5, 11, 20, 25, 28, 30, 33, 34, 35, 36, 40, 42
Bx 32	St Ann's Avenue	Bx 26, 29, 30, 33, 42
Bx 33	138th Street Crosstown	Bx 1, 3, 25, 26, 29, 31, 32, 41
Bx 34	163rd Street Crosstown	Bx 2, 3, 5, 25, 26, 29, 31, 41, 42
Bx 35	167th Street Crosstown	Bx 3, 25, 26, 29, 31, 41
Bx 36	180th Street Crosstown	Bx 3, 20, 25, 28, 29, 31, 40, 41
Bx 40	Tremont Avenue	Bx 3, 20, 25, 28, 29, 31, 36, 41
Bx 41	Webster Ave & White Plains Rd	Bx 2, 11, 25, 26, 28, 29, 30, 33, 34, 35, 36, 40, 42
Bx 42	Westchester Avenue	Bx 2, 3, 25, 29, 30, 31, 32, 34, 41

Total: 85 transfer pairs

The greatest gap filled by the pattern of transfers proposed here is in the vicinity of Wyckoff and Myrtle Avenues where seven routes converge. Of the free transfers recommended, 17 are among these seven routes. The other major deficiency that these recommendations remove is the lack of free transfers between the Myrtle Avenue B-54 route, and the fourteen routes which cross it. Most of the remaining recommendations are for free transfers to and from the B-26, B-38 and B-52 routes, running along Putnam, DeKalb and Gates Avenues, respectively. These routes primarily serve employment and retail concentrations in Downtown Brooklyn. The detail for each bus route that directly affects Bushwick is shown in Table C and earlier on Map 4.

East Tremont and South Bronx. Recommendations for free transfers affecting East Tremont were extended to cover all of the low-income areas of south-central Bronx. The lack of transfers here, shown on Map 6, should be remedied by creating a network of free transfers covering an area bounded by 180th Street to the north, Southern Boulevard to the east, Bruckner Boulevard to the south and Morris Avenue to the west. With this system, all residents of low-income areas in the Bronx will be able to reach local job concentrations by bus without a double fare. In all, 85 free transfers are recommended, as listed in Table D and shown earlier on Map 5.

Reverse commuting by railroad

The market for out-commuting to the suburbs by low-income workers is not very large. Of all the City residents who had less than average incomes, about 70,000 were reverse commuters in 1960. This number has increased since, and further increases are likely. While comparable figures from the 1970 Census are as yet unavailable, the Census 1970 Employment Profiles found over 40,000 out-commuters (about 8 percent of the labor force) from the City's four major low-income areas alone. Only a small fraction of the reverse commuters, however, is likely to travel by rail, because it is difficult to get from suburban railroad stations to most industrial destinations, and because only 13 percent of the low-income area residents live within walking distance of railroad stations in the City.

Nevertheless, enabling low-income workers to use the suburban railroads in the reverse direction is important because: (1) most of the commuter lines traverse low-income areas without helping them much, even though any opportunity for access to the better-paying suburban jobs would be welcome; (2) the trains travelling in the reverse direction during peak hours have most of their seats empty: a valuable resource going to waste.

To attract low-income workers who would be using another mode before getting to the railroad station, reverse commutation fares should be reduced by 75 percent. These special tickets would be valid between midnight and noon in the outbound direction and between noon and midnight in the inbound direction. For a 25 to 35 cent fare, one would be able to travel as far as 20 or 30 miles during the designated hours.

Should the special tickets be valid from all stations in New York City, the railroads would, initially, lose about 7.5 percent of their revenues with this arrangement. Should the special tickets be valid only from designated stations in or near low-income areas (such as 125th Street, 138th Street, Morrisania, Tremont, Fordham Road, High Bridge, Flatbush Avenue, Nostrand Avenue, East New York, Woodhaven, Jamaica, etc.) but not from Manhattan terminals, the

initial loss in revenues would be on the order of 2 percent. Part of this loss, of course, would be made up by increased ridership, which could include close to 2,000 workers from low-income areas, plus anyone who would want to travel during the designated time in the designated direction. The remainder of the loss should be made up by revising the fare structure in such a way that the fare charged better reflects the costs a particular rider imposes on the railroad. Thus, the reverse commuter who fills an available empty seat during off-peak hours imposes very little additional cost. But the long-distance inbound commuter, for example, who causes tracks to be maintained and trains operated for distances of 40 to 50 miles, imposes great costs; yet, under current pricing practices, he gets, on a per-mile basis, roughly a 70 percent discount compared to the rider who comes in from a distance of 5 to 10 miles. Thus, making the fare structure more responsive to costs should pay for the reduced reverse commuting fares without general governmental subsidies.

The existing schedules are by-and-large adequate to serve the reverse commuter. Additional stops are suggested for only a few trains of the Long Island Railroad. However, the New Haven Railroad, because of past franchise arrangements, does not stop in the Bronx at all. This excludes Bronx residents from obtaining jobs in several concentrations along the New Haven Railroad in Westchester and Fairfield counties. These concentrations are much more convenient to the railroad than those on the Harlem and Hudson divisions. At least three local New Haven trains in the morning (outbound) and in the evening (inbound) should stop at Morrisania, Tremont and Fordham Road.

Of course, to be fully effective, reverse commutation fares and adjusted schedules must be coupled with job information, training and placement programs; without these, low-income workers are likely to remain unfamiliar with suburban job locations because of the great distances involved; also, arrangements for pick-up from the railroad station to the plant will be necessary in most cases.

Subway construction needs of low-income areas

Though low-income workers use the subway about 13 percent less frequently than all workers (mostly because they are less likely to travel to the Manhattan Central Business District), Manhattan-oriented subway lines are nevertheless of importance to low-income areas: overcrowding and slow speed rank very high among the complaints low-income residents voiced about the transit system, as previously mentioned. The two major trunklines of the current subway expansion program are aimed at relieving precisely these problems, among others. The trunklines are (1) the 63rd Street tunnel, now under construction under Central Park and the East River, with its Queens high-speed bypass extension along the Long Island Railroad, and (2) the Second Avenue Subway, now under design, with its Bronx high-speed bypass extension along the former New York, Westchester and Boston Railway. This billion-dollar program will have a Region-wide impact and be of direct help to low-income areas of Harlem and the South Bronx, which depend on employment in the Central Business District to a high degree. However, the degree of its usefulness to low-income areas of the Bronx will depend on certain adjustments which will be described below. Apart from the two major trunklines, there are other, less costly projects that would improve both the access to and the environment of specific low-income areas, and should likewise be afforded a high priority.

1. Jamaica and Southeast Queens

South Jamaica is the only major low-income area in the City which is beyond walking distance of the subway; the adjacent Jamaica Center, the largest downtown of Queens borough, slated for expansion as a major regional office and educational center, lacks direct subway access to most of the City, and its environment is blighted by an elevated line. The Jamaica railroad station, an important transfer point, lacks direct access to the subway system. The new South east Queens subway line, (Route 131-D and 133) part of which is scheduled for construction in the near future, is designed to solve all of these problems. However, important options are still open as to exactly how the southernmost leg of the line through the residential area of South Jamaica is to be built.

This southernmost leg, 3.2 miles long, is planned to proceed from Archer Avenue and Twombly place under the York College site to South Road and thence follow the Long Island Railroad Atlantic branch to Springfield Boulevard. This leg could be built three different ways:

a) By constructing retaining walls to widen the existing railroad embankment, and adding two transit tracks alongside the railroad tracks, which would remain in operation.

b) By building a subway on this or a parallel alignment, as advocated by several local groups.

c) By closing the Atlantic branch to railroad trains, taking over the existing roadbed for transit operation with a minimum of new construction and consolidating all railroad operations on the Montauk branch, which would be widened from 2 to 3 tracks.

The first approach has several disadvantages: the bulky structure with high retaining walls would have a very negative impact on the environment of residential areas of South Jamaica. The unsightly railroad trestle, which connects the Atlantic Branch to the Jamaica station would remain, largely precluding development of a planned medical complex on a site contiguous to York College. The Long Island Railroad would continue to suffer inefficiencies because of operation over two separate lines and the constricted entry into the railroad station from the east. Finally, the construction cost would be high because of the need to build 3 miles of 2 new tracks, and of moving the existing railroad tracks to the side in the same right-of-way.

The second approach would put the subway noise and dust underground, but the existing elevated railroad trestle adjacent to York College would remain; there would be no incentive to remove it, and constricted access into the Jamaica station would also remain. The cost of this solution would be twice as high as that of the first, perhaps higher because the water table in the area is close to the surface. This high cost is hardly warranted in view of the relatively light passenger load anticipated on the line (about 25,000 one-way passengers daily). On a per-passenger basis, such a subway would be almost three times as expensive as the Second Avenue subway.

The third approach appears to be by far the most effective. The appearance of the present railroad embankment would not change--it could be landscaped and provided with sound and dust baffles to reduce the impact from the greater number of trains using it. The elevated trestle would be removed, improving the



Two views of the existing Long Island Railroad Atlantic Branch trestle north of South Road in Jamaica, encroaching upon the York College Urban Renewal Project and preventing its expansion to encompass a future medical school site. Suggested consolidation of suburban train service on an expanded Montauk Branch of the LIRR would enable the removal of this structure.





Two views of the existing Long Island Railroad Atlantic Branch embankment south of South Road in Jamaica. Doubling its width to accommodate subway trains would have a severe impact on the residential environment. Suggested consolidation of suburban train service on an expanded Montauk Branch of the LIRR would enable the use of this embankment for subway service largely as is, with minor modifications for safety and amenity.



environment and allowing the medical school site to be developed adjacent to York College. Long Island Railroad operations would be consolidated on the Montauk line which, with three tracks and the removal of the St. Albans and Springfield Gardens stations would provide non-stop high-speed service from Jamaica Station to Valley Stream; the three-track capacity with a reversible center track would be ample for the foreseeable future. The capacity constriction at the east end of Jamaica station would be removed, and the track layout simplified. The added track on the Montauk line would pass in part through an industrial, rather than a residential area. Last but not least, the construction cost could be significantly lower: only 3.2 miles of a single track would have to be added to the Montauk line. The Transit Authority would gain the ability to have storage tracks beyond Springfield Boulevard at nominal extra cost.

The third solution is strongly recommended to give subway access to south Jamaica. Stations on the new line should be provided at 108th Avenue near South Jamaica Houses, Linden Boulevard, Baisley Boulevard, and Springfield Boulevard; to reduce impact on South Jamaica Houses, their station could be located in an open cut, after the line leaves the subway but before it ascends to the embankment; particulars of the design should be given attention and developed with community participation.

2. Bushwick and East New York

As pointed out in the discussion of bus routes, a major need in Bushwick and Central Brooklyn is to improve access to the industrial areas of Greenpoint, Maspeth and Long Island City. By subway, such access is now provided by the GG crosstown line, which connects to the A and E trains at Hoyt-Schermerhorn in downtown Brooklyn and to the LL Canarsie train at Lorimer-Metropolitan in Bushwick. However, a large number of Bushwick and Bedford-Stuyvesant passengers who use the M, KK and QJ trains on the Broadway BMT elevated cannot get to the GG line in any direct way. Therefore, providing a free transfer from the Broadway BMT to the Crosstown IND line is recommended. For this purpose, the Hewes Street and Lorimer Street stations on the Broadway elevated should be closed (the station spacing in this area is unreasonably close, about 1,500 feet) and replaced by one new station at Union Avenue, with direct escalator access to the Broadway station of the IND below.

The major transit problem in Bushwick and adjacent areas of Brooklyn, especially East New York is less one of access than one of the degradation of environment because of elevated lines. Unfortunately, removal of the Broadway BMT elevated line does not look feasible in the near future because of the huge cost--on the order of half a billion dollars. However, there is an opportunity to remove one of the City's worst eyesores--the tangle of elevated lines at East New York Junction, and about 2 miles of the Canarsie elevated line, by relocating it in the virtually unused right-of-way of the Bay Ridge Division railroad, and its existing tunnels under East New York. The operation of the Canarsie line would be speeded up and it would at the same time provide--for a cost of about \$105 million--most of the service to East Flatbush and Flatlands that a Utica Avenue subway would have provided at a cost of \$280 million. Industrial jobs in the Flatlands area would become accessible by subway to Bushwick and Central Brooklyn residents.



The four-track Bay Ridge Division railroad tunnel under East New York, unused except for occasional local freight deliveries. Relocating the two-track Canarsie rapid transit line south of Bushwick in the Bay Ridge Division right-of-way would enable the removal of 2 miles of the blighting Canarsie elevated line (shown on the opposite page, paralleling the railroad cut), as well as a major part of the tangle of elevated lines at East New York Junction (opposite page, bottom). The relocation, extended to Utica Avenue, would make the construction of the three times more costly Utica Avenue subway unnecessary.



The Brooklyn-Queens Crosstown subway line passes under the Jamaica elevated at Broadway and Union Avenue in Brooklyn, without any transfer connection. Consolidating the Hewes and Lorimer Street stations on the elevated into one new station at Union Avenue with escalator access to the subway would improve access for Brooklyn workers to the industrial areas of Greenpoint and Long Island City.



Reconstruction of the Canarsie line is included in current plans of the MTA and the City, but not as a priority project. Advancing the reconstruction of the Canarsie line through East New York in the Bay Ridge railroad right-of-way from Bushwick Avenue to Utica Avenue is recommended. Transfers from the line could be provided to the Fulton Street IND and the Long Island Railroad at a new station under East New York, to the New Lots IRT from a new station at Livonia Avenue, with other stations located at Pitkin Avenue, Linden Boulevard, Rockaway Parkway, Ralph Avenue and Utica Avenue.

3. Tremont and the South Bronx

To an even greater degree than Central Brooklyn, the low-income areas of the South-Central Bronx suffer from the blight of elevated lines, particularly the 5.5-mile Third Avenue elevated and the 3-mile section of the White Plains Road line on Westchester Avenue and Southern Boulevard. In addition to causing blight, the Third Avenue "el" provides unsatisfactory service: the trip is slow (about 13 mph) and an inconvenient transfer to overcrowded trains is necessary at 149th Street. Travel patterns in East Tremont investigated as part of this study showed five out of six riders choosing the faster White Plains Road line in preference to the Third Avenue "el" despite the position of the study area squarely between the two, and despite the double fare which this entailed for many. Thus, even though the "el" carries as many passengers as either leg of Cleveland's rapid transit, its removal has been a long-standing community objective.

The interim plan currently adopted for implementation in 1973 calls for replacing the "el" with express buses from Gun Hill Road in the north to two termini in the south, at 161 Street and River Avenue, and at 149 Street in the Hub area, with free transfers to the subway at all three points. Though bus running times will be generally longer than those of the elevated line, reduced headways and shorter access time to stops are expected to make the bus service roughly comparable to the present one. A more elaborate bus feeder network was deemed not feasible because of the greater number of free bus-to-subway transfers it would have required.

Removal of the elevated will leave a two-mile gap between rapid transit lines in the City's most densely populated area outside Manhattan, in the heart of a low-income community of half a million inhabitants. It is recognized that the bus service is not an adequate long-term solution. The March 1972 study by Solomon & Schwartz Associates investigating the possibilities of bus service, found it desirable to provide "the most flexible transit alternatives until a rationalizing of the rapid transit system will be able to permit construction of a modern subway route to serve this corridor". *

Unfortunately, past planning for the South-Central Bronx has not looked at "rationalizing of the rapid transit system", but merely at replacing the elevated as an isolated project. The latter has a very low priority in current MTA plans for two reasons, among others: 1) A relatively low-cost solution, such as expand-

* Solomon & Schwartz Associates; Chase, Rosen & Wallace, Inc. Preliminary Report, Bus System Replacement of the Third Avenue Elevated Railway. March, 1972.

ing the Penn-Central railroad cut to accommodate subway trains, would fail to provide adequate service to the central Bronx. It would be too close to the Grand Concourse IND line and too far from the White Plains Road IRT line. 2) A line through the center of the poorly served area, which would minimize walking distance to all riders in the area, would require extensive tunneling through hard rock, and would have a high cost per rider.

This dilemma can be solved, if the objective is broadened to one of "rationalizing the rapid transit system" in the entire Bronx, and removing the Westchester Avenue-Southern Boulevard elevated as well. This would clear all of the Central Bronx--from Grand Concourse to the Bronx River--of elevated lines. A new subway through the Central Bronx could be located so that virtually no one in the area would have to walk more than 2,500 feet to a station and, attracting users from both former elevated lines it would have a patronage that would amply justify even costly construction.

While long-range subway planning is clearly outside the scope of this study, the subject is brought up because it has short-range implications. The extension of the Second Avenue subway through the Bronx, known as Route 132-B, is currently in preliminary design, and its location will be finalized shortly. Certain features in its design might effectively preclude the joint replacement of the two elevated lines with a new subway in the future, or at least make it much more expensive and inconvenient. Therefore, long-term subway planning objectives for the low-income area of the South-Central Bronx ought to enter current decisions on the design of Route 132-B. Moreover, from the standpoint of the low-income areas of the South-Central Bronx, the location of Route 132-B, as adopted in the Route and General Plan of 1968, has a number of other flaws.

1. Laid out to maximize the use of unused surface right-of-way along the New Haven Railroad, it denies the benefit of a new subway line to the declining Hub area of the South Bronx, which needs an impetus to renewal most. In effect, it provides a bypass around the poor area for middle-income riders from the northeastern Bronx.

2. Its peripheral location precludes convenient interchange with most of the existing subway services in the Bronx. Access from the eastern Bronx to the Hub area or to western Bronx or to the West Side of Manhattan will be just as difficult as before. Such intra-Bronx access is important, if the borough is to develop more self-contained centers and reduce its dependence on Manhattan.

3. If connected to the Pelham elevated line, as initially planned, the new line will reduce the load on overcrowded Lexington Avenue expresses by only about 10 percent, while the Lexington Avenue locals will be drained of about 60 percent of their traffic from the Bronx. In fact, the Pelham line subway (up to Hunts Point), which the new line will duplicate, will become very sparsely used, while elevated lines will carry their former load.

Therefore, engineering investigations of alternatives to the adopted alignment of Route 132-B along Bruckner Boulevard and 138 Street (such as a Willis Avenue, Westchester Avenue, E 163 Street route) as well as of alternative service patterns (such as not connecting to the Pelham elevated line) would be of value to the low-income areas of the South-Central Bronx. They could also lead to superior service for middle-income residents on the periphery of the Bronx.



The Third Avenue elevated in the Bronx, built in the late 1880's, long recognized as a blight on the surrounding low-income community. Its demolition and temporary replacement with express buses is scheduled for 1973. Plans for an eventual replacement with a modern subway have a low priority, largely because the project would be costly per rider, if built as an isolated improvement.

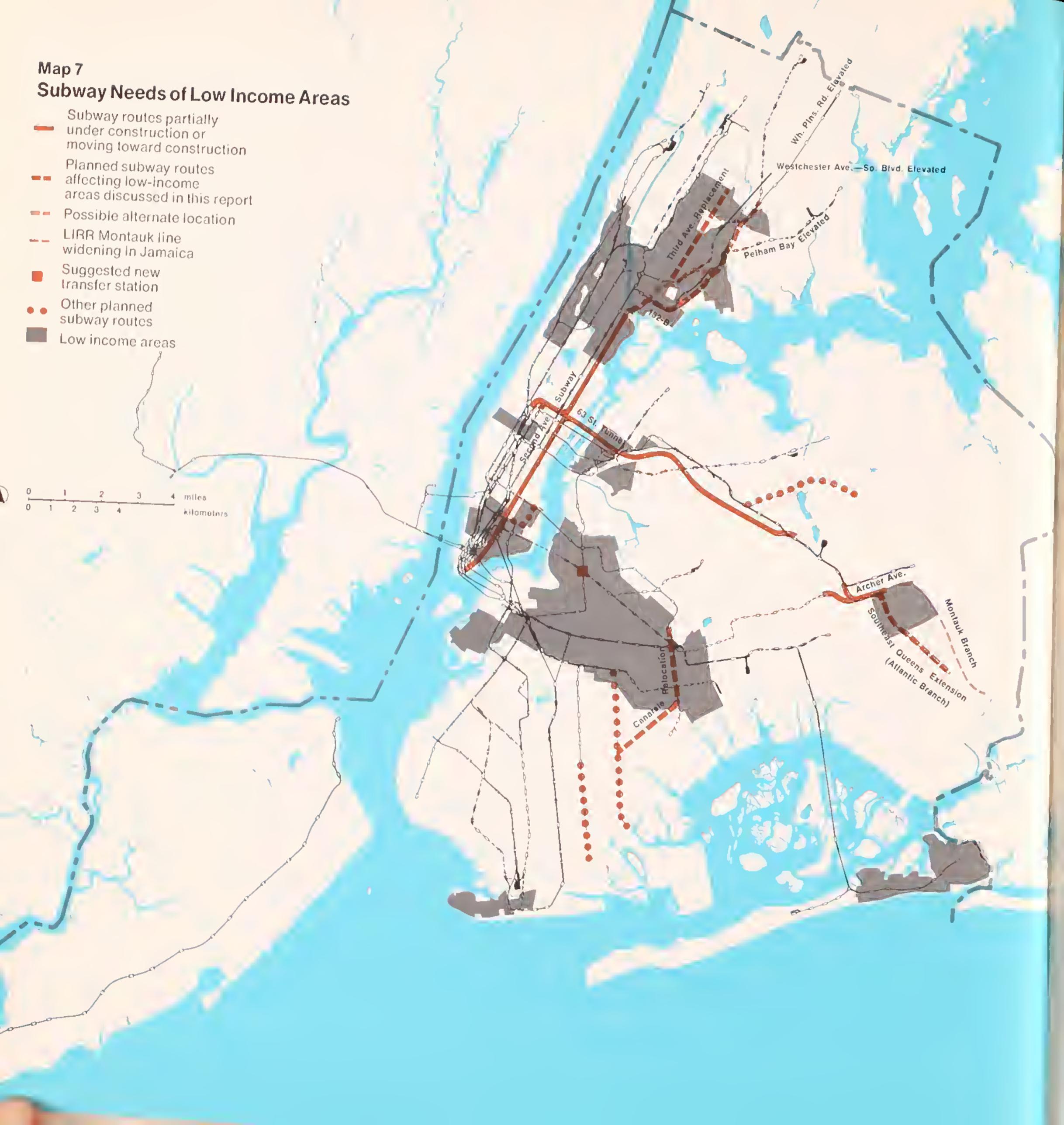


The Westchester Avenue—Southern Boulevard elevated, built in 1905, whose blighting effect is just as bad, is to remain intact under current plans. The replacement of both elevated structures with one new subway would be a cost-effective solution that would spur the redevelopment of the Hub and Fordham Road areas, while providing for better circulation within the borough.

Map 7
Subway Needs of Low Income Areas

-  Subway routes partially under construction or moving toward construction
-  Planned subway routes affecting low-income areas discussed in this report
-  Possible alternate location
-  LIRR Montauk line widening in Jamaica
-  Suggested new transfer station
-  Other planned subway routes
-  Low income areas

0 1 2 3 4 miles
 0 1 2 3 4 kilometers



Facilitating low-income work trips by auto

A low-income worker without a car is only one-third as likely to commute beyond the City line as one with a car. Moreover, longer trips within the City to lower-density manufacturing destinations are usually made most conveniently by auto. In most cases, no public transportation system can serve as an adequate alternative on these types of trips, simply because not enough of them follow the same path. The dependence of the low-income worker in New York City on the automobile has increased in the past decade, and auto use does offer him substantial gains in travel time, in wider job choice, and in income.

It is fully realized that uncontrolled growth in auto use in the core of the New York Region cannot be sustained in the long run, and that the damages to the environment caused even by the present patterns of use are severe. The Proposed Plan for Meeting Federal Air Quality Standards, prepared by the Department of Air Resources of the New York City Environmental Protection Administration (January 1972) is the first major step toward correcting the present situation. In the long run, development of a non-polluting vehicle, a more compact pattern of the Region's land-use, with greater density and more clustering of economic activity, which would allow more public transit use, and improved transit facilities will be necessary. Steps toward these objectives should be vigorously pursued - but not at the expense of the low-income worker, who is caught up in the existing pattern of travel and job location. Thus, the following policies are aimed at the immediate future, before any large-scale controls over the Region's growing dependence on the automobile take hold:

1. Overnight parking, registration, and "city auto use" taxes, which may prevent the low-income worker from owning an auto but are not much of a deterrent for the well-to-do should not be instituted or increased; rather, higher tolls, surcharges on all-day parking in business districts as well as simply the reduction in available pavement should be used to keep automobiles out of specific areas, where they are environmentally damaging.

2. Steps should be taken to reduce the cost of automobile insurance, which is particularly high in New York City. These include no-fault insurance and passing on to the consumer savings made possible by it; design standards for automobiles which will make them less prone to damage; requiring insurance companies to extend the territories for which insurance rates are set so that the cost of high-risk areas is spread more widely.

3. As a part of training and job placement programs, part of the down-payment cost for small new cars which meet specified standards of durability and economy should be subsidized if the low-income worker cannot reasonably travel to his job by means other than auto. The down-payment subsidy could provide the basis for a low-cost loan over three to four years from a credit union or a similar institution. Community cooperatives in low-income areas could take on the sale and financing of small new cars under this arrangement, which would be substantially more economical in the long run than the purchase of large used cars by low-income workers as well as less polluting.

4. Residential parking in low-income areas should be facilitated by making vacant lots, operated by community organizations for a nominal fee, available where there is not enough on-street space, by permitting perpendicular or angular parking in surplus street space (where double-parking is usually practiced anyway) by tailoring alternate street parking regulations more closely to actual street cleaning schedules. There appears to be unnecessary use of the auto because of on-street parking difficulties in areas of high residential density.

5. Surface traffic flow in low-income areas should be improved with wider use of accepted traffic engineering techniques, including a greater use of one-way streets, signal timing more responsive to flow, channelization of complex intersections and closing of selected residential streets to traffic. Community interest in special traffic studies focused on their areas was expressed in some of the low-income areas surveyed, notably in Tremont.

6. Policies which led to a virtual moratorium on new expressway construction in the City should be re-evaluated in the light of the low-income area needs. Expressways are important to the low-income population not only because they are the basic means of access to higher-paying blue collar jobs outside the City, but also because, by reducing trucking costs within the City, they encourage the retention of blue-collar jobs within the City. It has been shown, for example, that truck use of the Lower Manhattan Expressway would directly benefit plants with about 130,000 blue collar jobs. As Map 8 indicates, low-income areas, especially in Brooklyn, tend to have worse than average expressway access. While many parts of the City have a highly developed expressway grid and should not receive any new expressways, several important gaps remain in the network. Among past expressway proposals which remain relevant to low-income area needs outside Manhattan are the following:

a) The Brooklyn-Queens Interboro Expressway from Astoria along the Connecting railroad right-of-way, under East New York, to the Belt Parkway.

b) The Cross-Brooklyn Expressway along the right-of-way of the Bay Ridge railroad from the Narrows Bridge approaches to East New York.

c) Interboro Parkway relocation on top of the Montauk railroad through Maspeth and Glendale; this could remove the existing obsolete pavement from Highland Park and a part of Forest Park and return this right-of-way to park use.

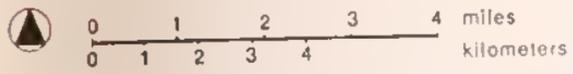
d) Completion of the Sheridan Expressway interchange with the Cross-Bronx Expressway and the Bronx River Parkway, making use of the virtually unused Sheridan Expressway.

e) Completion of the Clearview Expressway, which would provide added access from Jamaica to the north and east.

7. Car pooling, which is generally workable only when there is a tight cluster of jobs in one place (i. e., a very large plant, such as the Ford Motor Company at Mahwah where the probability of several workers going in the same direction is high) is seldom used by low-income workers in the New York Region. Nevertheless, car pool information centers operated by community organizations may prove to be useful. Should the San Francisco device of letting three or more people in a car ride free on toll bridges on weekdays be tried in this Region, non-Manhattan oriented facilities such as the George Washington Bridge, the Narrows Bridge and Staten Island bridges could be candidates. Encouraging car pools into Manhattan however, would primarily tend to reduce mass transit use.

Map 8.
Gaps in the Expressway
Network

- Parkways and expressways, existing or under construction
- Low-income areas
- Areas more than one mile removed from expressways or parkways



DATA COLLECTION NEEDS

An investigation of the means whereby a large labor supply with diverse skills can be linked more effectively to available job opportunities naturally requires an extensive and current data base. This is available in the most comprehensive form from the decennial censuses of population. Thus, the 1970 Census developed an extensive description of the employment characteristics of the residents of major low-income areas in New York City in its new series Employment Profiles of Selected Low Income Areas. This study, however, was completed prior to the publication of the bulk of 1970 Census data, and had to rely on estimates, constructed for inter-censal years. The estimating process, which reconciles partial and inconsistent data series, is inherently subject to error.

It is therefore imperative that more resources be placed at the disposal of the regional offices of federal statistical agencies to provide current informational requirements, particularly during inter-censal years. From the perspective of this study, several critical data deficiencies emerged, having mostly to do with employment characteristics by place of work. It is recommended that these needs, among others, be met by a regional information system, established within an existing agency, built upon a cooperating relationship between all public agencies which collect related data, and maintained on a consistent annual basis. For greatest applicability, this system should provide coverage of the entire 31-county Region, beyond present boundaries of regional federal offices, and report on an individual county basis, rather than a labor market area, with some series designed to yield specific small area detail.

1. A comprehensive annual series of total employment by industry and county, identifying all jobs including non-wage and -salaried employment in all industries on a 2-digit SIC basis.
2. A corresponding series providing small area estimates of total employment by industry for significant sub-county concentrations such as the Manhattan CBD, and Newark.
3. Collection of the Insured Employment series by industry and postal zone, with refinements of data when feasible.
4. Surveys by county and significant small area concentration to develop, and identify changes in, the occupational composition of industry employment; a comprehensive annual series of total employment by occupation and county.
5. A comprehensive reporting on job vacancies collected from state Employment Service offices and adjusted to reflect openings by county and significant small area with industry detail.
6. A comprehensive annual series of resident labor force characteristics by county, including participation rates, skills, and unemployment characteristics; a corresponding series for significant sub-county residential areas, such as Newark.
7. A comprehensive series of total employment earnings by industry, occupation, and county.
8. Collection of manpower training program statistics and follow-up surveys on the employment status of trainees.

HIGHLIGHTS FROM SUPPORTING RESEARCH

Jobs in the region

1. The economy of New York City is predominantly white collar, and becoming more so. Almost 60 percent of the 4 million jobs it offers are in professional, managerial, clerical and sales positions, following the Census Bureau definition. Over an eight-year period in the past decade, an estimated 225,000 new jobs in these white collar occupations were created in the City; by contrast, only 54,000 new jobs in service occupations opened, and blue collar jobs declined by 33,000.

2. The skills of the City's resident labor force lag behind the needs of its economy. Only 52 percent of the resident workers have white collar occupations. During the past decade the net increase in white collar skills among resident workers was less than one-quarter of the increase in white collar jobs, and the increase in service skills--less than one-fifth of the increase in service jobs. The deficit was filled by a virtual elimination of unemployment in the white collar and service occupations, by more double jobholding, and by increased commuting from the suburbs.

3. Though the City's resident labor force has remained stable during the eight-year period, at about 3.5 million, large shifts occurred in its ethnic composition. The net out-migration of some 235,000 white workers to the suburbs was balanced by the entry of an almost equal number of Blacks, Puerto Ricans and Orientals, who filled 33,000 professional and managerial, and 96,000 clerical and sales jobs. Yet, despite these encouraging advances into white collar occupations, the upgrading of skills among ethnic minorities is proceeding at a slower pace than the expansion of the economy demands.

4. Between 1968 and 1985, New York City's employment is expected to grow at a slower rate than in the recent past, but white collar jobs will become even more the mainstay of the City's economy, as shown earlier. The upgrading of skills among Blacks and Puerto Ricans holds the key to how many of the new jobs will be filled by City residents. Assuming that the City's resident labor force grows marginally (by some 90,000) and that white out-migration continues at the past pace, Blacks, Puerto Ricans and other "minority" groups will account for almost half, or 46 percent of the City's resident labor force by 1985, compared to 28 percent in 1968. If the occupational distribution by age, sex and race changes at the same rate in 1968-1985 as it did in 1950-1968, then the number of minority workers entering white collar occupations will increase from the equivalent of 55 percent of new entrants into the labor force in the recent past to 66 percent in the forecast period. However, the surplus of unskilled workers in the City is unlikely to be eliminated, because the new and better qualified entrants into the labor force will still be outnumbered by older workers carrying forward skills of the predominantly blue collar and service orientation developed in the past. Under this projection, blue collar and service workers would still comprise 45 percent of the City's resident labor force in 1985, while only 36 percent of the jobs in the City would be in these categories.

5. In the recent past, chances for the employment of unskilled and semi-skilled blue collar workers from the City in the suburbs were small. By 1968, the 12 suburban counties within about 30 miles of New York City had 39.2 percent of the Region's blue collar jobs, and 39.3 percent of the Region's blue collar workers resided in them. New York City, with 42.7 percent of the Region's blue collar jobs, had 42.4 percent of the Region's blue collar workers. However, this apparent balance changes if one separates blue collar jobs into skilled, well-paid jobs such as craftsmen and foremen, and lesser-skilled ones such as operatives and laborers. In the former category, there was an unmet demand for 25,000 positions in the City, which were among the jobs held by commuters. In the latter category the City had 75,000 unemployed. Conversely, the surplus of the 12 suburban counties consisted of some 30,000 skilled blue collar workers, most of whom were among commuters to the City, and 25,000 lesser skilled workers who remained unemployed. Thus, unemployment in lesser-skilled blue collar occupations was 9 percent in the City and 3 percent in the suburbs. Equalized unemployment rates would give City workers 20,000 suburban jobs, under conditions of a full-employment economy. Without equalized unemployment, City residents could expect to find only about 3,500 suburban blue collar job vacancies given full employment.

6. In the future, suburban blue collar job opportunities for City residents are not expected to increase greatly. Between 1968 and 1985, the 12 suburban counties are expected to attract 156,000 blue collar jobs, most of which will be jobs relocated from the City. However, most of this growth will be matched by the growth in the suburban labor force. Even though additional jobs will become available in the 14 outer counties of the Region, where factory employment will grow rapidly, a regionwide surplus of blue collar skills over blue collar jobs is projected to persist in the future, given recent trends. Repeating the assumption of equal unemployment rates throughout the Region, the additional suburban job openings for blue collar City residents may be on the order of 40,000, though their skill composition will be improved.

7. For the vast majority of City residents, opportunities for employment are and will remain in New York City. Seeking avenues for the advancement of the City's lesser-skilled residents, one must look for jobs that: can be entered without extensive formal schooling; are anticipated to grow in the near future; and presently exceed the City's available labor force, suggesting an inflow of suburban commuters. The clerical, service and skilled blue collar categories fit at least two of these criteria.

a) The lesser-skilled white collar opportunities which can be qualified by a high school or business school diploma and occur in clerical and sales occupations account for roughly half the white collar employment in New York City and are expected to increase by some 170,000 jobs by 1985. The present excess of jobs over resident workers in this category in the City is about 150,000. The location of these jobs--particularly the clerical ones--is highly concentrated: 40 percent of all the clerical jobs in the Standard Consolidated Area (which includes New York City and 12 suburban counties) are located in the Manhattan Central Business District, and 60 percent in a somewhat wider area including the rest of Manhattan, the East River industrial band, Downtown Brooklyn and Newark.

b) Many service occupations, particularly in consumer related or

medical services, can be entered without a high school diploma, though additional training is usually needed. By 1985, service opportunities are expected to provide 70,000 additional jobs, and the present excess of jobs over resident workers in the City is an additional 70,000. The location of service jobs is only slightly less concentrated than that of clerical ones; 40 percent are in the Manhattan Central Business District; however, the line encompassing 60 percent of all service jobs in the Standard Consolidated Area (SCA) extends farther, bypassing the industrial concentrations in Brooklyn but encompassing residential areas in Central Brooklyn, and in the higher density parts of the Bronx and Queens.

c) Skilled blue collar occupations, such as craftsmen and foremen can, better than others, provide relatively high-paying jobs for undereducated workers, particularly men: over 75 percent of these jobs are now held by men, in contrast to only 40 percent of the semi-skilled white collar and service jobs. Skilled blue collar jobs in the City are expected to decline mildly, by about 8,000, toward 1985, but the present excess of jobs over resident workers is substantial--some 25,000, and the number of jobs held by commuters is much larger. Because of job turnover, retirements and deaths about 9,000 openings annually are expected in this category, which could be available to City residents with proper training programs, assistance from labor unions and absence of discrimination. Geographically, opportunities in skilled blue collar work are much more dispersed than those in clerical and service work. The area including the top 40 percent of these jobs in the SCA encompasses, aside from the Manhattan Central Business District and its vicinity, clusters in Harlem and the South Bronx, in Long Island City and Corona-Flushing, a large area from Greenpoint to Bush Terminal in Brooklyn, and several small clusters in Bergen, Hudson, Nassau and Westchester counties.

d) Semi-skilled and unskilled blue collar jobs, which pay the lowest wages, in which the bulk of the blue collar employment decline will occur, and in which both the City and the Region have a surplus of unemployed workers, account for almost one-fifth of the City's employment. They offer few opportunities for advancement, but are the only jobs in which better chances of suburban employment could be of help to City residents. Their geographic pattern is similar to, but more clustered than, that of the skilled blue collar jobs. They form a tighter ring around the Central Business District, encompassing the South Bronx, the Long Island City and Brooklyn waterfronts, the New Jersey waterfront near Hoboken, and are thus located, predominantly, in close proximity to the City's poverty areas.

8. A survey of 325 manufacturing firms in and around New York City suggests that vacant positions in the time of a recession averaged 2.3 percent of total jobs, whereas during a period of full employment they were close to 4 percent. About two-thirds of these openings were in blue collar jobs, whereas during full employment about three-quarters would have been in blue collar jobs; this confirms the "last to be hired, first to be fired" sensitivity of low-skilled work to business cycles. Regardless of cycles, however, job openings in older areas of the City, such as Brooklyn, were more plentiful than in the newer ones, such as Flushing, or in the suburbs. This can be explained by the lower wages characteristic of areas with high vacancies. Generally, while a larger share of jobs in the City are in the upper-income brackets, the likelihood of avoiding a low-paying job is much better in the

suburbs. Thus, in the establishments sampled, 59 percent of the service workers in the City earned less than \$5,000 a year, but only 42 percent in the suburbs. Among operatives and laborers, 42 percent in the City earned less than \$5,000 a year, but only 34 percent in the suburbs. However, the highest suburban wages are generally associated with more distant locations, where vacancies were low. Roughly half of both the City and suburban firms sampled provide on-the-job training for semi-skilled workers, but the compensation paid to trainees is better in the suburbs; 71 percent of the suburban trainees are remunerated at the regular wage scale, contrasted with only 35 percent in the City. Some 14 percent of the suburban employers offer transportation to the plant.

9. In the future, blue collar job opportunities in the manufacturing concentrations within the City will decline: the Manhattan CBD is expected to lose almost 100,000 blue collar jobs by 1985, and further declines will occur in the East River industrial band and the Bronx. These losses will be only partially offset by New York City's industrial renewal programs, including: the Southwest Bronx Industrial District (2,500 jobs); nearby Hunts Point Food Processing and Distribution center; Greenpoint industrial renewal area (7,500 jobs); the nearby Brooklyn Navy Yard (15,000 jobs) and Gowanus (9,200 jobs). Other major projects are Zerega Avenue in the Bronx (5,000 jobs); College Point in Queens (12,000-15,000 jobs); the Flatlands in Brooklyn (over 8,000 jobs); and an industrial park north of JFK airport.

10. Future shifts in white collar jobs must also be taken into account. Transportation improvements necessary for white collar work should, when possible, perform the double duty of serving blue collar concentrations and poverty areas as well. By 1985, the Manhattan CBD is expected to receive 310,000 new office jobs; taking into account the out-movement of factory jobs and some increase in other employment, the net increase is expected to be 255,000 jobs or 11 percent of present employment. Assuming that some routine office work generated by the CBD can be spun off to other boroughs, the rest of New York City will experience a net increase of 104,000 jobs by 1985. Of these, some 80,000 jobs are expected to be in office buildings outside the CBD. Public action has been taken to concentrate half of this increase in two sub-centers--Downtown Brooklyn and Jamaica. Both are located close to poverty areas and will generate, apart from office jobs, institutional, retail and other employment.

Poverty in the city

1. City residents are not receiving their proportionate share of the growing wealth of the Region. Over the past two decades, average money income of families and unrelated individuals rose, in real terms, by about 39 percent in New York City, whereas in 12 suburban counties it rose by 47 percent. In 1968, the average income of City income recipients was \$8,530--about 1 percent above the average for the Nation--whereas that of suburban ones was \$11,160.

2. Though the average City income is currently about the same as in the Nation, the distribution of income is much more unequal. The lower half of families and unrelated individuals in the City receive 20 percent of the ag-

gregate money income, compared to 23 percent in the Nation. The wealthiest 10 percent receive 30 percent of all income in the City, compared to 26 percent in the Nation. In New York City, 37.5 percent of all income recipients are in the "under \$5,000 annually" income class, compared to 32.9 percent in the United States as a whole and 29.9 percent in the Region. This large low-income group is offset, in the City, by a comparatively less numerous middle class, and an upper-income group that, while little different from the Nation in relative numbers, is substantially richer.

3. The share of the total income received by the lower half of the City's population advanced from 19 percent in 1949 to 21 percent in 1959, but seems to have fallen back to 20 percent in 1968. By contrast, the share of total income received by the top 15 percent of the population fell from 45 percent in 1949 to 38 percent in 1959, but advanced back to 40 percent by 1968. In the 12 suburban counties around New York City, the picture has been quite different. The share of the income received by the lower half of the population advanced from 20 to 23 to 24 percent in the 1949, 1959, 1968 periods, and that of the upper 15 percent receded, respectively, from 48 to 38 to 35 percent. In both instances significant income redistribution occurred during the nineteen fifties, when poverty was not much of an issue, while during the nineteen sixties, when poverty became prominent in the public eye, real improvement became much slower in the suburbs, and the City actually suffered a setback.

4. Between 1949 and 1968, the proportion of people with low incomes (less than \$5,000 a year, adjusted to 1968 prices) declined most rapidly in the Nation, somewhat slower in the 12 suburban counties, and slowest of all in New York City. As a result, the City in 1968 contained 5.5 percent of all the low-income recipients in the Nation, a slightly larger share than twenty years ago.

5. Total family income is an imperfect measure of poverty, because needs vary depending on family size. For the purposes of this study, two sliding scales, which vary with family size, are used: that of the U.S. Census, which defines "hard-core" poverty and that of the U.S. Bureau of Labor Statistics, which includes the poor and the near-poor. The former definition classifies about 1 million City residents, the latter almost 2.5 million (out of a total population of 8 million in 1968) as impoverished. The former figure corresponds closely to the City's welfare caseload, the latter includes the working poor.

6. Well over one-quarter of the hard-core poor are single, and about one-quarter of all single residents in the City are, in turn, among the hard-core poor. Among persons in middle-sized families hard-core poverty is less pronounced, but rises again in large families. The near-poor are mostly in middle-sized and large families. Thus, 45 percent of all families with six or more members are in the two poverty groups.

7. As is well known, Blacks and Puerto Ricans account for a disproportionate number of the poor and near-poor. In 1968, it is estimated that close to 58 percent of Black and Puerto Rican families in New York City were

in the "under \$5,000 annually" income class, as opposed to only 19 percent of white non-Puerto Rican families; in 1966, 72 percent of the male workers among Blacks earned less than \$5,000 annually, compared to 39 percent among whites.

8. Among the approximately one million hard-core poor in New York City in 1968 there were 550,000 children and about 500,000 adults. Somewhat more than half of these adults could not, for the most part, participate in the labor force either because they were heads of Aid to Dependent Children (ADC) households, or because they received public assistance due to old age or disability. This leaves about 240,000 adults among whom the potential for employment was greater; 60 percent of them did not receive any public assistance and many had, presumably, at least occasional jobs.

9. The New York City Cooperative Area Manpower Planning System (CAMPS) provides a definition of poverty that is about half-way between the "hard-core" and the "near-poor" definitions used above, and suggests a poverty population of 1.75 million in New York City in 1971. Again, the majority of these are either children or adults not potentially employable for reasons of child care, age, or permanent disability. In its 1970-71 plan, CAMPS defines the target population for manpower services as 745,000: of whom 444,000 are employed full-time, but at inadequately low wages; 130,000 are partially unemployed; and 171,000 are not in the labor force, but potentially employable. It is estimated that 7 to 11 percent of this target population are served by training programs, at a 1970 cost of \$116 million, or about \$1,500 per trainee.

10. The location of poverty within New York City is highly concentrated. In 1967, about 20 percent of all welfare recipients in the City lived in areas containing some 5 percent of the total population, and another 50 percent in areas containing 20 percent of the total population. A similar pattern emerges from data on Federal income tax returns. The poorest areas, with a reported per-capita income roughly one-third below the citywide average, contained roughly one-quarter of the City's population. This population was concentrated on less than one-fifth of the City's land, at an average density of 43,500 persons per square mile, compared to 37,000 in lower middle-income areas, and 29,500 in well-to-do areas, excluding, in each case, land in parks.

The poverty areas of Central Brooklyn (Bedford Stuyvesant, Brownsville, East New York) represented the largest concentration, with some 680,000 residents or 8.7 percent of the City's total; Harlem, with about 485,000 residents was the next largest concentration, and the nearby areas of South-Central Bronx followed closely with 436,000. Apart from these large concentrations there were several smaller ones, notably the Lower East Side in Manhattan (170,000), Coney Island in Brooklyn (40,000), and in Queens, parts of Far Rockaway (47,000), of Long Island City (20,000) and of South Jamaica (18,000). The official designation of poverty areas as developed by the New York City Council Against Poverty is somewhat more extensive and detailed than that given above, and that based on the Model Cities Program is more restricted. The Model Cities areas included a population of 786,560 in 1970. Whatever the definition, Manhattan has the largest share of its population residing in low-income districts, while Brooklyn accounts for the

largest number of poor people in the City; the Bronx ranks poorest in terms of average percapita income. With regard to ethnic composition--Blacks, Orientals, other nonwhites and Puerto Ricans comprise about 87 percent of the Model Cities population in Harlem, about 82 percent in Central Brooklyn, and about 79 percent in the Bronx.

Transportation service

1. In 1960, 3.3 million of the New York Region's 7 million workers, as defined by the Census, lived in New York City. In round figures, 145 thousand City residents were reverse commuters to jobs in the suburbs, while 535 thousand suburban residents commuted to New York City. Thus, the total number working in New York City was 3.7 million; half of them, or 1.85 million worked in the Manhattan Central Business District; some 350 thousand of the Central Business District workers, or close to 20 percent, were commuters from outside New York City. The Central Business District was the place of work for 46 percent of the City's residents; the next most important destination was one's own borough outside the CBD: it was the place of work for 40 percent of the City's residents. Commuting among boroughs other than to the CBD involved less than 10 percent of the City's residents.

2. Among different categories of commuters there was a clear stratification by income. Thus, on the average, New York City residents who worked in New York City had the lowest incomes. Suburban residents who worked in the suburbs had higher incomes. Reverse commuters from New York City to the suburbs had higher incomes than the local suburban workers. And the incomes of suburban commuters into New York City were the highest of all: the proportion of high-income workers among them was five times greater than among City residents.

3. Residents of poverty areas in New York City found their employment predominantly within their own boroughs, or even within the poverty areas themselves. Among the lower-income workers of Central Brooklyn, South Bronx, and Harlem close to one half (46 percent) had jobs either within these areas, or in adjacent industrial districts. About 40 percent travelled to the Manhattan Central Business District. Very few were reverse commuters to jobs in the suburbs.

4. Generally, the lower the income of a worker, the shorter is his journey-to-work. In 1960, workers earning less than \$5,000 annually are estimated to have travelled, on the average, about 6.7 miles to jobs in the Manhattan Central Business District and 4.2 miles to jobs elsewhere in the Region. In both cases, the journeys of middle-income workers were more than one and one-half times longer and those of high-income workers, more than twice as long. A different source of data suggests that in 1963 workers earning less than \$4,000 annually travelled about 3 airline miles to work if they lived in New York City, and about 2.3 miles if they lived outside New York City. Again, the distance travelled rises sharply with rising income. Travel time does not increase with increasing income as much as travel distance, indicating that higher-income workers travel at higher speeds.

5. Reduced auto ownership reduces both the length and the speed of trips to work at each income level, both within and outside New York City. Reduced auto ownership and reduced income also reduce the total number of percapita trips for purposes other than work. In 1963, New York City residents with household incomes below \$4,000 made about 1 trip by mechanical means per person per day, compared to more than 2 trips per day for persons from households with incomes above \$10,000. Percapita travel outside New York City was higher because of lower densities of development.

6. The choice of mode for travel to work--public transit vs. the automobile--is most strongly affected by the density of employment at the place of employment; for workers in the low-income groups, and to a lesser extent for those in the middle-income group, the density of residences at the place of residence is also important. The third major factor is the relative directness and speed of the public transit trip as compared to the auto trip; surcharges on the auto trip, such as tolls and parking fees, also have an influence. Together, these factors explain 76 percent of the variation in auto vs. transit use in the Region, based on rather coarse data from the 1960 Census. As incomes rise, the importance of the density variables declines, and the importance of the variables pertaining to the performance of the transportation system increases.

7. In the Region as a whole, railroad use for travel to work rises sharply and consistently with rising income; subway and bus use, as well as walking, tend to decline with rising income, though each in a somewhat different pattern. Auto use increases as income rises from the low to the upper middle-income group, but then declines again in the highest income categories. However, if one takes the lowest income group alone (below \$3,000 in 1960), several of these trends are altered somewhat: thus, with its shorter average trip, the low-income group tends to use the subway about 13 percent less frequently than the average worker. Auto use is, understandably, some 24 percent less frequent, according to 1960 data. Bus use is about the same. Walking is more frequent among low-income workers, and so is working at home and the catch-all category of "other" modes.

8. The effect of auto ownership on the choice of mode in travel to work is somewhat similar to the effect of income. Rail use is completely independent of auto ownership. Subway use is largely independent of auto ownership: outside Manhattan, almost half the subway users own cars, an ownership rate only slightly lower than among the population as a whole. In contrast to rail and subway, bus use is very sensitive to auto ownership, and declines sharply once a household has acquired at least one car. Walking to work also declines sharply with rising auto ownership, though less so in high-density areas.

9. New York City's subway network, though geared predominantly for travel to Manhattan, is more accessible to the poor than to the well-to-do. In 1966, about 55 percent of the City population with incomes below \$3,000 lived within 2,000 feet of subway stations; by contrast, only 44 percent of those with incomes above \$10,000 lived within that distance. The average for all City residents was about 52 percent. However, the 10 or so major industrial districts

in New York City outside Manhattan, which account for about 35 percent of the City's blue collar industrial jobs, are fairly inconveniently located with regard to the subway system. About 44 percent of their workers come to work by automobile.

10. Subway ridership is responsive to the fare charged; in the recent past, a 10 percent increase in fares corresponded to about a 1.1 percent decline in subway ridership. With a 35 cent fare, the low-income subway rider pays 4.5 percent of his income for travel to work, as against only 2 percent for the average subway rider; these shares double in the case of a double fare.

11. On a per passenger-mile basis, bus travel is one-and-one half to three times more expensive than subway travel, due to its labor intensity and slow operating speed; the latter also confines 90 percent of all bus travel in the Region to local trips less than about 6 or 7 miles in length. Express routes over longer distances, which can work to a high-density concentration such as the Central Business District, are seldom feasible to dispersed outside destinations. While the bus system in New York City has generally maintained or increased its ridership over the past 15 years--except for declines due to fare increases--ridership on local lines outside the City has been declining continuously.

12. The total cost of operating an automobile in New York City, calculated on a per passenger-mile basis, is roughly the same as the per mile cost of local bus fare, if no tolls or parking fees are involved. On an annual basis, owning and operating an auto amounts to about 15 percent of the low-income worker's wages. The three major components of this cost, about equal in size, are direct operating cost, capital cost, and insurance. Taken together, the first two components are not significantly lower for a used, as compared to a new, standard domestic car. For some small cars, however, both components can be reduced about 40 percent. No-fault insurance has been demonstrated to reduce insurance costs significantly. On the other hand, total auto cost can be increased 50 percent or more by means of tolls and parking fees.

13. Between 1960 and 1970 the number of passenger automobiles registered in New York City increased by 15 percent, or 14 percent on a per-capita basis. Compared to the previous decade, the slowdown in the rate of automobile growth was greater in the City than in the suburbs; this may be attributable in part to the worsening economic position of the City compared to the rest of the Region during that decade, in part to congestion. On a per-capita basis, the increase in auto availability to City residents was fairly similar in Manhattan, Queens, Brooklyn and Bronx, even if slightly lower in the latter two boroughs; the Staten Island rate was much higher and more comparable to that of the suburban counties.

14. Automobile travel for all purposes presently accounts for more than 70 percent of all trips in the Region, and about one-third of all trips in New York City. Auto trips by City residents about equal subway trips in number. Auto use continues to increase, and poverty areas demonstrate a surprisingly high dependence on the automobile.

15. In the most recent 5-year period, the rate of expressway construction was the lowest in 20 years, both in New York City and in the Region. While expressway construction obviously cannot continue forever in a geographically limited area, the City's expressway system still has major gaps, primarily in Brooklyn, but also on Staten Island and in Queens. In addition to 210 miles of expressway now in the City and 10 miles under construction, about 30 miles are needed to complete the expressway network. By any of several measures, Brooklyn has the worst expressway access, a situation that seriously affects the poverty areas of Central Brooklyn.

Three case study areas

1. Areas selected for detailed study, including home interviews were South Jamaica in Queens, Bushwick in Brooklyn and East Tremont in the Bronx. These three areas each have more than 30 percent of their population receiving welfare and more than half living beyond 2000 feet of a subway station. Their population densities vary from a low of 19,200 per square mile in South Jamaica to a high of 132,000 per square mile in East Tremont. Each one is in a different part of New York City, which provides varying perspective in relation to the employment concentration in the City and beyond.

2. From some 2500 homes surveyed during 1970 (an 8 percent sample) characteristics of the work force were determined. The labor force participation rates for the three areas averaged 49.2 percent, considerably below the 62.4 percent of the City's minorities. Both male and female participation rates were well below the average for New York City minorities. Women's participation rates were particularly low, less than half the average.

3. The unemployment rates of the three study areas ranged from 8.1 percent in South Jamaica to 16.3 percent in East Tremont. The average unemployment rate for the three study areas combined, 12.5 percent, compared poorly with the City-wide minority rate of 5.4 percent. Since both high unemployment and low participation rates are associated with females and with the younger population, much of the poor performance of the three study areas when compared with the City-wide minority data is due to the more youthful structure and the under-representation of men in the study areas.

4. Youth and poor educational attainment each have a negative influence on employment. Males under 25 years of age are disproportionately represented in the unemployed group. Educational attainment has still a greater effect on the likelihood of having a job. Men who have not graduated from high school have an unemployment rate more than three times as high as those who have graduated from high school, 15.7 percent to 4.9 percent. Women fare more poorly in both categories; those who have not graduated from high school have an unemployment rate of 30.2 percent; those who have, 9.3 percent. The "drop-outs" from the labor force, those who do not work without any given reason, are about as numerous as the unemployed seeking jobs.

5. Using wages under \$100 per week as a measure of "underemployment" it was estimated that 18.9 percent of men in the three study areas who held jobs were underemployed. The comparable figure for women was 42.7

percent. Average incomes were calculated by age, sex, educational attainment and possession of driver's license. By significant amounts, the young earn less, women earn less, and the uneducated earn less. A new dimension was added, however, those that do not drive also earn less. Possession of a driver's license meant an average earning of some \$30 more per week, almost as much impact as a college degree.

6. Almost twenty-five percent of all those over 16 years of age in the three study areas make up a "target labor pool" where substantial improvement in economic opportunity is necessary. The various demographic and employment characteristics discussed above were combined to determine this "target labor pool" made up of employed persons under \$100 per week, the unemployed members of the labor force, non-working mothers over 40 and half of the "drop-outs".

7. Study area residents do not work in numbers proportionate to the number of jobs in the CBD. They do work in proportion to their expected numbers outside the City. Only 27.2 percent of the workers in the three study areas work in Manhattan's Central Business District but 5.3 percent work outside New York City. Half work in the same borough as they live.

8. Automobile use for travel to work from the study areas increased substantially between 1960 and 1970. The percentage of workers going to work by car appears to have gone, in round numbers, from 14 to 18 percent in Bushwick, from 35 to 47 percent in South Jamaica, and, rather incredibly, from 17 to 49 percent in Tremont. Auto ownership rates in these areas, however, remained essentially static, with anywhere from 27 percent (in Bushwick) to 60 percent (in South Jamaica) of the households owning cars. The figures thus reflect a greater use of the same number of cars for the journey to work, probably for reasons of spreading job locations, less reliable and more expensive transit, and so on.

9. Subway use for trips to work declined between 1960 and 1970, by moderate amounts in South Jamaica and Bushwick, but much more in East Tremont, so that subway trips now account for 32, 48 and 30 percent of the trips to work from the three areas, respectively, based on home interviews. These results are supported by turnstile counts, except in East Tremont, where the actual decline appears smaller than the interview results would suggest. Bus use declined only slightly and accounts for 16 percent of the trips to work from the three study areas combined. Walking remained constant at an average of 7 percent of the trips to work, higher in areas of higher residential density.

10. Viewing work location and mode of travel simultaneously shows that poverty areas near heavy employment concentrations will have more workers who use public transportation. For example, almost 80 percent of Bushwick residents who work in Brooklyn use public transportation, mostly to Downtown Brooklyn. By contrast, in the Bronx and in Queens, where no employment concentration is particularly large or stands out much above the others, most residents destined for places within their home borough drive. Also, large numbers of persons drive to work in the CBD when they live in

places with difficult connections to the subway system. South Jamaica and East Tremont fit this category. Third, with the exception of some bus trips from South Jamaica to western Nassau few workers travel beyond the City line by means other than the automobile.

11. All workers living less than 1000 feet from a rapid transit station walk to the subway. The majority of those living beyond 2500 feet take a bus. Less than 5 percent of the rapid transit users walk more than a mile. This shows that even low-income area residents value the ability not to walk anywhere between 0.5¢ and 3.0¢ for every 100 feet. However, the two-fare bus-subway trip is not too prevalent among low-income residents, except in Jamaica, because few of them live beyond walking distance to the subway. By contrast, the two-fare trip involving two buses, appears to be more prevalent in low-income areas than in the City as a whole.

12. The average auto trip to work in the three study areas tends to be shorter than the subway trip, but longer than the bus trip; it ranges from a low of 3.8 miles in Bushwick, with its relatively high density and frequent employment opportunities nearby, to 7.2 miles in Jamaica, with its low density and widely scattered opportunities. The average speed ranges from a low of 7 mph in Bushwick to a high of 10.2 mph in Jamaica, measured door-to-door. This compares to transit speeds (subway and bus combined) of 4.7 and 7.6 mph, respectively; thus the auto offers a very substantial speed advantage.

13. Auto travel to work is also associated with higher earning power, though it is difficult to pinpoint which is the cause and which the effect. In the three study areas, in 1970, transit users who had no cars earned an average of \$117 a week; auto users who had no cars (i.e. rode with others) earned \$134 a week; transit users from households which had cars earned \$128 a week (a figure weighted down by the lower incomes of second wage earners), and auto users from households with cars earned \$146 a week.

14. Car-pooling, or riding with others was found to be infrequent in the three study areas: in South Jamaica, 10 percent of the auto users were passengers, in East Tremont 12 percent and in Bushwick 13 percent.

15. Based on the responses to the home interviews, it is clear that whether poor, middle-income, auto users or transit users, most people are far from satisfied with the transportation system. High cost, long trips, crowding and filth are the most common complaints. Excessive walking and transferring and poor information are complained about least. Nevertheless, evidence from the study suggests that some people take unnecessarily long trips, which could be obviated by better information. Auto users are generally somewhat less dissatisfied than transit users; 14 percent of auto users and 4 percent of transit users were satisfied. However, auto users complained about equally about high costs as transit users: almost half of each group find the cost of travelling to work excessive. Income level and travel mode appear to have little bearing on how people feel about transportation costs.

PART 2. RESEARCH SUPPORT

CHAPTER 1. RECENT EXPERIENCE

Introduction

In the early 1960's, America came to the realization that a rising national income does not automatically insure a rising income for everyone, and that an underprivileged minority is being left behind the bandwagon of affluence. Policies for a full-employment economy, even when successful, are not sufficient to eliminate poverty, so long as discrimination and other barriers compartmentalize society, so long as there is a skills gap between available manpower and available jobs, and geographic gaps between the location of residences and accessible employment opportunities. In the New York Standard Consolidated Area today, more than half of the job opportunities (55 percent) require white collar skills, but only 30 percent of the relatively lower-income Black and Puerto Rican residents are equipped with these skills. Moreover, more than three-quarters of these minority residents (70 percent of whom are blue collar and service workers) live in the Region's older core area, while the growth in jobs for which they are presently qualified has taken place in the suburbs.

In the anti-poverty efforts of the past decade, a measure of agreement emerged on the steps which are necessary if the eradication of poverty is a serious national objective. The first and most obvious one is a larger transfer of income from the well-to-do to the

poor, guaranteeing a basic standard of living for everybody, administered so as to encourage additional earnings through employment, and financed at the national level so as to relieve individual localities of the burden of supporting the poor who happen to be concentrated there. It is widely held that an adequate minimum income is, among other things, a prerequisite for success in education.

Educational and training programs to equip the underprivileged with the skills demanded by a technologically advanced economy are the most difficult, but also most vital second step. The needs range from compensatory education at the preschool to the college level; from gearing high school curricula to the needs of an office-oriented economy to breaking down discrimination barriers in apprenticeship training in the trades; from providing mental health services for individuals to expanding opportunities for experience in community leadership.

Of course, educational programs are long-term, and for those out-of-school, job training, preferably on-the-job, provides a more immediate opportunity. This has been a major emphasis of federal anti-poverty programs so far. In New York City, a recent study found 44 different manpower training programs, operated at a cost of over \$100 million annually; half of them received federal support.

Assessing the overall needs of minimum adequate income maintenance and educational programs in 1967*, the Regional Plan Association found that in New York City alone expenditures for poverty-linked services would have to be doubled, and that for the nation as a whole such a program would require, with a federal takeover of all local costs, a federal anti-poverty budget of about \$36 billion annually recalculated in present prices. This study suggests still higher income-redistribution needs.

Because fitting people to skilled jobs through education and training has its limitations, the creation of new jobs to fit the available manpower is a third step. In the public sector, a multitude of jobs remain undone while the people who could do them remain unemployed: health services, building construction and repair, maintenance of streets, parks and subways are some of the most obvious examples. In the private sector, all kinds of jobs would spring up if wages below the present minimum became possible on the basis of a guaranteed living standard provided for everybody.

The fourth step is overcoming the geographic separation between people and jobs. In 1960, both in the nation as a whole, and in the New York Region, the number of blue collar, semi-skilled and unskilled jobs located in central cities was greater than the number of workers in these categories who lived there, so that on balance there was in-commuting by low-income groups toward the central city. In the past decade, however, the continued dispersal of blue collar jobs through suburban low-density areas, accessible only by auto, has been accompanied by an increasing concentration of the poor in old parts of central cities, the only place where cheap housing is available. In the long run, this problem will yield only to a concerted effort toward: 1) changes in housing and zoning policies which will allow more low-cost housing near new suburban jobs and more middle-income housing in the central city; 2) changes in the regulation of urban development, which will prevent an unnecessary dispersal of those opportunities which need not be dispersed. Indeed, there well may be a requirement established to cluster selected jobs, educational and community facilities in urban centers within reach of low-income areas.

In the short run, improvements in transportation geared specifically to the needs of poverty areas can

alleviate some of the imbalances and enhance opportunities for employment. It is this latter, short-term approach which, in full cognizance of its limitations, is the main focus of this report.

Transportation deficiencies were first singled out as one of the factors contributing to poverty by the McCone Commission report, Violence in the City: an End or a Beginning, issued following the 1965 riot in the Watts area of Los Angeles. In July, 1966, the Department of Housing and Urban Development responded by establishing a bus demonstration project in Watts to improve access to employment as well as to educational, medical and other facilities. In September, 1967, a new program of HUD grants was initiated for technical studies of the public transportation needs of low-income neighborhoods. Thirteen cities received such grants in 1968.* By the fall of that year, the Department of Transportation was offering 90 percent grant assistance to demonstration projects to job concentrations and numerous similar studies were underway under the auspices of various anti-poverty organizations. The experience of these efforts merits a brief review, before we turn our attention to conditions in New York City.

Transportation demonstration projects and technical studies

In examining the results of several selected transportation-employment technical studies and demonstration projects, we will deal with two types of areas: 1) those in which central city poverty residents are denied access to growing suburban job markets; and 2) county studies of the suburban poor whose mobility is limited due to the scattered nature of suburban job centers. Obviously, the first type of area is more relevant to the needs of New York City's poverty populations, but county studies afford some interesting material as well--particularly in regard to providing access to relatively nearby, but hard-to-reach employment sites.

The study areas range in size from Oakland, with a poverty area population of 43,500 and a City

* The cities were: Phoenix, Ariz.; San Bernadino, Fresno, Oakland and San Jose, Calif.; Lawrence, Mass.; Omaha, Nebr.; Chicago, Ill.; Richmond, Va.; Newark, N.J.; Syracuse, N.Y.; Denver, Colo.; and Honolulu, Hawaii.

*Public Services in Older Cities. A report of the Second Regional Plan, New York, May 1968

population of 361,600 to Los Angeles County, with a target population of almost 500,000 in two poverty areas and a County population of over 7 million in 1970 (See Table 1).

Employment, Income and Poverty levels. The most obvious measure of the need for jobs in a given population is the unemployment rate. An examination of the published documents of a number of transportation experiments reveals that the measures used to determine unemployment and income levels were diverse. Standard measures such as labor force participation (for age groups, by sex and educational levels) were often missing. Nonetheless, a pattern is clear -- of high unemployment and low income in target areas compared to the surrounding areas.

In three western cities (Denver, Los Angeles and Oakland) unemployment in the target areas ranged as high as 14.5 percent (Oakland) and in Denver, unemployment in the poverty area was more than four times that of the City as a whole. Median family income in the target areas of many cities was often at least \$3,000 lower than in surrounding areas. (See Table 2). Many cities reported that from one-fourth to one-third of the residents of target areas were subsisting on below poverty level incomes. In San Bernardino, for instance, 27 percent of depressed area families earned under \$3,000 while the same is true of only 18 percent of all City families. In Worcester, one-third of the poverty area households earned under \$3,000 and of these, nearly 20 percent earned under \$2,000. In other cities, similar findings on income and unemployment were reported: in Syracuse, almost 24 percent of central city poverty residents were receiving welfare; and half of the North Nashville Model Cities Area population had incomes below the poverty level in 1960.

Though most studies mentioned underemployment as an equally serious problem, very few were able to accurately quantify these levels. At the Transportation and Poverty Conference of the American Academy of Arts and Sciences (in Brookline, Mass., June, 1968) Peter B. Doeringer reviewed the 1966 unemployment and subemployment rates of slum areas in selected SMSA's, some of which have since been selected for transportation-employment experiments. In general, subemployment in poverty areas ranges from two to five times higher than unemployment in these same areas, and up to eight times higher than

unemployment in an entire SMSA. (An extract of this information appears in Table 3).

Education. Another measure common to most transportation-employment studies is a comparison of educational levels attained by poverty area residents in contrast to those of the surrounding city or region. Again it was found that the disadvantaged were further handicapped by a lack of schooling. In St. Louis, a sample of white unemployed residents in low income areas adjacent to a new bus line showed that the median number of school years completed was seven, the same as that of a predominantly Black population in the study area. Denver, on the other hand, reported

Table 1.
Population of Major Cities Studied as Examples of Transportation-Employment Experiments.

Place	Total Population		(Year)
	In 1970 Control Area ^a	Poverty Area	
Denver, Colo.	514,678	170,000	(1969)
Los Angeles, Calif.	2,816,061 ^b	499,160	(1965)
South Central		320,830	
East Los Angeles		170,330	
Nassau County, N.Y.	1,426,838	n.a. ^c	
Newark, N.J. ^d	920,986	362,417	(1970)
Oakland, Calif.	361,561	43,460	(1966)
Saint Louis, Mo.	622,236	n.a.	
San Bernardino, Calif.	104,251	51,098	(1968)
Suffolk County, N.Y.	1,127,030	n.a. ^c	
Worcester, Mass.	176,572	31,707	(1965)

^a Refers to the entire city in most cases, except when the project used a county or region as its base.

^b Refers to population of City. Los Angeles County population is 7,012,071.

^c Populations studied were sample groups in scattered poverty areas; do not include all poverty areas in the county.

^d Essex County is control area, City of Newark is poverty area.

Source: Published reports of transportation employment experiments supported by Department of Housing and Urban Development grants under the Urban Mass Transportation Act of 1964, as amended. Also, 1970 Census.

Table 2.
A Comparison of Characteristics of Poverty Area Residents in Selected Transportation-Employment Experiments: Unemployment and Income.

(Year)	Area	Unemployment (%)		Median Family Income (\$)	
		Pov. Area	Control Area	Pov. Area	Control Area
(1967)	Denver	10.9%	2.7%	\$3,204	\$6,845
(1960)	Los Angeles Co.		5.8		7,046
	South Central	11.0		4,733	
	East L.A.	8.1		5,084	
(1968)	Nassau/Suffolk	6.0 est	1.7 est	3,640 est	
(1966)	Oakland	14.5	8.4	4,830	7,025
(1968)	St. Louis	12.9 ^a	4.5 ^a	1,096 ^b	5,690 ^b
(1968)	San Bernardino	2.8 ^c	1.7 ^c	n.a.	n.a.
(1965)	Worcester	3.7	2.5	n.a.	n.a.

^a 1966 estimates for North St. Louis area and SMSA.

^b Sample populations only.

^c Represents percent seeking work, grossly underestimates unemployment, which was at least 6.0% for the city as a whole in 1968.

Source: Published reports of transportation-employment experiments supported by Department of Housing and Urban Development grants under the Urban Mass Transportation Act of 1964.

a relatively high median education level of 10.9 years for poverty area residents, but this was in contrast to a City median of well over twelve years. (See Table 4).

A study of residents in poverty pockets of Nassau and Suffolk Counties indicated that as many as half of the young people were not high school graduates--this in counties with two of the highest median education levels in the State. In Chicago, a Department of Transportation and City-sponsored study of Black communities on the south and west side, and of Appalachian whites in the mid-north portion of the City, showed that almost 16 percent of the unemployed respondents had an eighth grade education or less, compared to only 2 percent of employed respondents. Only 25 percent of the unemployed sample had completed high school, in contrast to 70 percent of the employed. And in San Bernadino, 42 percent of all household heads have not completed high school and 71 percent of this group reside in the poverty area studied.

Table 3.
Subemployment and Unemployment Rates in Disadvantaged Areas, 1966.

Area	Unemployment Rate	Subemployment Rate	SMSA Unemployment Rate
Boston (Roxbury Area)	6.9%	24%	3.7%
New Orleans	10.0	45	n.a.
Philadelphia (North)	11.0	34	4.3
Phoenix (Salt River Bed Area)	13.2	42	n.a.
St. Louis (No. Side)	12.9	39	4.5
San Francisco (Mission-Fillmore Area)	11.1	25	5.2

Source: Douinger, Peter B. *Ghetto Labor Markets - Problems and Programs*. A paper delivered at the Transportation and Poverty Conference, American Academy of Arts and Sciences, Brookline, Mass. June 7, 1968. p. 4

Table 4.
Educational Attainment of Poverty Area Residents in Selected Transportation-Employment Experiments.

Place	Median Years of School Completed	
	Poverty Area	Control Area
Denver	10.9	12.0 +
Los Angeles		12.1
South Central	9.5	
East L.A.	8.6	
Nassau/Suffolk	n.a.	11.7
Newark	9.0 ^a	10.6 ^a
Oakland	9.7	12.2
St. Louis	7.0 ^b	11.2
San Bernardino	n.a.	12.0
Worcester	n.a.	10.6

^a City of Newark is poverty area and Essex Co. is control area

^b Sample population only

Source: Published reports of selected HUD-funded transportation studies. Also: Statistical Abstract of the United States, City and County Data Book, 1970

Accepting that having a good job is a high priority item for residents of poverty areas, the logical next step is to examine the occupational skills of target populations and to compare these skills with the needs of employers in the area. A few of the transportation studies did attempt such a task, and a brief summary of their conclusions follows.

Occupation and Skill Levels. One of the most comprehensive analyses of occupational and skill levels was done in the Oakland study, where Concentrated Employment Program (CEP) enrollees were examined by age, sex, education and work history. The CEP enrollees make up less than one-half of one percent of the total West Oakland target area population however, so that the characteristics of this group may not be representative of the entire target population. Still, the analysis was valuable as a model and should be cited.

First, it was found that the employment program attracted relatively undereducated males and females: 80 percent of the men and 64 percent of the women had not completed high school. Second, of the 105 male CEP enrollees, 78 percent listed themselves as craftsmen, service workers or laborers. Sixteen percent of the women enrollees described themselves as clerical or sales workers, and over 13 percent had held such jobs when last employed. Also in West Oakland, 42 percent of the CEP enrollees were on welfare; 9 percent were underemployed; and another 11 percent were not in the labor force for unspecified reasons.

A job accessibility study conducted in the Syracuse Model Cities neighborhood indicated that professional, technical and skilled workers had an unemployment rate of under 4 percent, but semi-skilled and unskilled workers were 12 percent unemployed. In Denver, 70 percent of the poverty area residents studied were unskilled, semi-skilled or clerical workers. In both Nassau and Suffolk Counties, the residents of poverty areas tend to be unskilled, while most job openings are for skilled and semi-skilled persons. In Chicago, a sample survey of employed and unemployed residents of poverty areas showed that only 12 percent of all employed residents were unskilled blue collar workers, in contrast to 58 percent of the unemployed sample. Almost 65 percent of all employed workers were in non-professional white collar occupations, while only 23 percent of the unemployed were similarly skilled, and 19 percent of the em-

ployed were professionals as opposed to only 5 percent of the unemployed.

In considering the possibility of matching the present skills of these target populations to jobs in the corresponding metropolitan regions, the outlook is discouraging. In the West Oakland poverty area, a survey of all residents (not just CEP enrollees) showed that 83 percent of the males worked as craftsmen, operatives, service workers or laborers while in the City as a whole, only 55 percent of the population is so employed. Almost 55 percent of target area females were operatives, service workers and private household workers and these occupations accounted for only 32 percent of the job market City-wide. Denver, with 70 percent of its poverty area residents in the unskilled and semi-skilled categories, considers itself as a "brain industry" leader. Recently, general job growth in Nassau County has begun to decline, and forecasts indicate that future growth will be mainly in the office and commercial sectors. Suffolk County has retained more moderate and low-skilled workers in its resident labor pool than other New York region counties, but a continuance of this trend will depend upon additions to the low-priced housing stock. In general, several studies confirm that many poverty area residents are not equipped with the proper skills to qualify for predominant types of new job growth. If this is so, perhaps the logical question is whether unemployment and labor force participation rates in central city and suburban poverty populations can be improved by creating better access--access to jobs of course, but also to training programs, educational facilities and the like.

In this regard, many transportation studies failed to make an appropriate assessment of the current travel patterns, preferences and needs of poverty populations. All too often, it was assumed that a long bus trip to an employment center would solve the job problems of the poor. The location of training centers, schools and other pre-employment facilities was often not considered in planning new routes. Analyzing the existing transportation patterns of the poor--not only in terms of cost, but in terms of distance, destination and time--is another important task of a transportation-employment study.

New transportation services and their impact on the poor

It is an oversimplification to measure the success or failure of a given transportation system only in terms of its ridership levels and cost, but all too often,

these were the only two evaluative criteria built into demonstration projects. Thus, a new bus line linking poverty area residents to an employment center might be dubbed a failure if initial riders failed to be consistent patrons over a given time period. But closer examination of such a situation might reveal that the bus line had matched riders with jobs so successfully that workers were later able to purchase their own cars. Similarly, subsidies which seem high in dollar amounts might conceivably be producing a wide range of social benefits, some of which are not apparent at first glance.

One thoughtful appraisal of a bus demonstration the "Employment Express" between Roxbury, Mass. and Route 128, which rings the Boston area with industrial parks--points out the fallacies of oversimplification mentioned above.⁴ The authors reveal that of the 89 "first riders" on this line, 67 were still working at firms on Route 128, but more than one-third had transferred to cars as their primary means of transportation to work. Though this leaves the employment express with less riders, it was also found that the buses were being used by persons who already had jobs on Route 128, prior to the inception of the new service. In this case, the demonstration has at least proved a limited success if measured by the ability of riders to find jobs, as opposed to their continued need for the bus line. Criticisms of the Roxbury demonstration include the following: 1) that the buses were not properly coordinated with plant shift times, and that schedules did not allow for overtime work; 2) that the ride was too long to attract those workers who might prefer to ride a bus, but who continued to use private autos; and 3) that the cost of the program did not justify the expense. As a result of the first criticism, the sponsors revised bus scheduling to meet the demands of two afternoon shift-ends at firms on Route 128. Since the last buses were still linked to the end of a normal shift, however, overtime opportunities were limited and it was not considered feasible to provide an additional bus which could leave at the demand of as few as one or two overtime workers. As for the length of the ride (almost 1 1/2 hours for some users) the authors suppose that higher speed buses may be the answer.

⁴ Carol S. Greenwald and Richard Syron. "Increasing Job Opportunities in Boston's Urban Core." *The New England Economic Review*, January/February, 1969, pp. 30-40.

Perhaps the best known of the transportation demonstrations is the South-Central and East Los Angeles project, where a series of bus lines were instituted to serve the residents of Watts and nine other Los Angeles poverty areas.

Here, two types of new transportation services were introduced: fixed route bus lines (3 in all) operating on regular headways, serving the general public living in and outside the poverty areas and geared to accommodate work, shopping, medical, recreational social, school and other trip purposes; and flexible routes on schedules designed to meet industrial plant shift changes and serving only project area residents. According to a summary of the project, the fixed route lines were generally more successful than the flexible work-trip lines, although preliminary studies had indicated that the greatest need was for access to work sites exclusively for project area residents.

In reviewing the preliminary data on which Los Angeles project planners based their choice of new bus lines, it becomes apparent that information on the current transportation patterns of target area residents was sparse. An interview survey of residents in the Avalon and Central districts of South-Central Los Angeles did attempt to relate the employment status of residents to incidence of auto ownership as well as to their methods and area of job-searching. They found that only 3 percent of the respondents involved in a job search used autos for this purpose, in contrast to 61 percent of the employed respondents who reported that they used autos for work trips. Fully 44 percent of those seeking work were dependent on public transportation, in comparison to only 28 percent in the employed sample; and 16 percent of the job seekers looked for work on foot, while only 8 percent of the employed respondents walked to work. (See Table 5 for auto ownership data in this and other studies).

Little was done in demonstration projects to analyze in detail how families with autos used their cars in relation to their use of transit systems; how employed non-auto owners fared in terms of their work trip length, time and cost; whether a second worker in an auto-owning family was dependent on public transit; how age, sex, income and education levels influence the work trip and so forth. In general it was the technical studies which examined some of these detailed questions.

An interview sample of poverty area residents of Worcester showed that about 90 percent of all bus riders seldom travel by any other mode, though only 54 percent of these riders reported that their households do not own a car. Of the bus riders with access to a car, almost 14 percent did not have driver licenses and nearly 28 percent reported that another household member was using the family car. A survey on Long Island showed that poverty and welfare households averaged only 0.44 cars while other households had an average of 1.04 cars. In San Bernardino however, where car ownership rates are high in both the City and the identified poverty areas, only 1.7 percent of all heads of households indicated they used the Municipal Transit System for their journey to work, and in the poverty areas, only 2.8 percent reported travelling to jobs by public transit; 33 percent of the poverty area households actually had 2 or more cars.

The success of the Century Boulevard Line, the first fixed route established in the Los Angeles demonstration, has been widely publicized. This thirteen mile-long, east-west line connects the ghetto target areas to International Airport, motels and hotels, commercial and industrial establishments, recreation areas, a General Motors plant and a large hospital, among other facilities. In addition, it connects with numerous bus routes of the Southern California Rapid Transit District (SCRTD) and, for an additional fare, with privately owned lines as well. One-way trips on the Century line cost 25¢ during the demonstration period of 32 months and 30¢ when the line was taken over by SCRTD in March of 1969. One-way passengers in a single weekday at the start of the demonstration totalled 883; a test made a few weeks after the SCRTD took over the line showed 3,517 one-way passengers on a typical weekday. In terms of ridership then, the line has obviously been a success. It should be noted however, that almost half of the riders were not from the original target areas. This fact may have some bearing on the conclusion that this line was more economical than some of the other Los Angeles demon-

Table 5.
Auto Ownership of Poverty Area and City Residents in Selected Transportation-Employment Experiments.

Place	Percent of Households with Auto			
	Poverty Area	(Year)	Control Area	(Year)
Denver	76.0%	(1967)	84.0%	(1960)
Los Angeles Co.			83.3	(1960)
South Central	65.4	(1965)		
East L.A.	64.8	(1965)		
Oakland	48.0	(1965)	74.9	(1965)
St. Louis	24.0	(1966)	60.0	(1968)
San Bernardino	76.8	(1968)	87.1	(1968)
Worcester	50.7	(1965)	76.3	(1965)

Source: Published reports of transportation-employment experiments supported by Department of Housing and Urban Development grants under the Urban Mass Transportation Act of 1964, as amended.

tration bus lines, since a large percentage of its revenues were contributed by non-project-area residents. Nonetheless, target residents were served by the line, as evidenced by this evaluation of the demonstration:

A balance sheet of project area residents' and non-residents' trips by trip purpose appears to favor the project area. There were about four times more work trips by project area residents than by non-residents across the project area boundaries. Recreation, medical and shopping trips show that there were 85 more trips made across the boundaries by project area residents than non-residents, representing a new importing of goods and services into the area. Amenities heretofore not accessible to project area residents have become available.

The Century Boulevard line, and other fixed route lines, did not, in the opinion of both poverty area residents and bus demonstration planners, serve all of the transportation needs of the target population. Non-profit sponsorship of small buses, which would operate like car pools and serve employment areas not accessible to fixed route lines, was recommended. It was assumed that the 36 to 40 buses to be used would operate with an average load factor of about sixty percent, and that the lines would become self-supporting within a relatively short period of time.

From the start, complications with the flexible routes arose. Other private carriers protested certain routes as "competitive." Insurance was difficult to obtain and was finally procured at approximately twice the rates charged to other local companies. Excessive breakdowns occurred when the first second-hand buses were rushed into operation without proper inspections and overhauls. Hoped for part-time driver-employees did not work out due to the unstable nature of many jobs available at destination points. Finally, routes were long, complicated and time consuming. In addition, the experiment was not considered successful because of the high cost of subsidizing the lines--as much as \$25 per week per passenger. Ridership was low except during the summer months, when vacationing students used the lines for temporary jobs. The most successful lines were those which were associated with job placement centers, and which could therefore "guarantee" a certain num-

ber of employment opportunities. In general however, trip times were three times as long as they would be by auto--up to five hours each day in some cases--to jobs paying as little as \$1.65 per hour. (In this situation, weekly take-home, after subtracting the bus fare, would be about \$54, not enough to justify an over-long and difficult trip).

It is almost impossible to obtain comprehensive information on the costs of new or proposed transportation services. According to Douglas Gurin:

Most bus companies are unable to specify costs of particular operations. The last report issued by the Nassau County Project gave the following range of basic costs per bus-day: from \$10.50 for an old, 31-passenger bus to \$27.80 per bus-day for a 1968 air-conditioned bus. Hourly labor rates varied from \$3.00 to \$5.00.

Though most cities with demonstration projects report on costs to passengers, as we have seen in Los Angeles, they often do not relate this to the total costs of the service.

In general, passenger fares for a one-way bus trip to employment centers (ranging from three to twenty-three miles in length) are between 25¢ and 50¢. The average fare in Nassau and Suffolk Counties was 26¢ one-way and it was estimated that the total cost for a one-way trip was approximately \$1.06. In Boston, the 50¢ one-way passenger charge contributed only about one-fourth to one-third of the total cost of a one-way trip. Some smaller lines, such as the community-sponsored lines in Los Angeles were estimated to cost up to \$2.50 per one-way passenger trip, with fares ranging from 25¢ to 45¢. From data collected so far then, one can estimate that charges to passengers of experimental bus lines cover anywhere from 10 percent to 30 percent of the total cost of such services. And if it is difficult to discover exactly how much a given system costs, any determination of the benefits accrued from a given transportation expenditure is even more elusive. Again, Douglas Gurin comments:

Benefit-cost evaluation is made complex when dynamic effects of employment and bus usage are attempted, since ridership composition and levels varied. No studies have shown how many people buses have helped find and keep jobs or that all bus

riders who are helped during the early stages of employment buy cars or join car pools and remain continuously employed.

One demonstration project which has attempted to keep track of some of these patterns is presently in operation on Long Island.

The demonstration bus lines on Long Island are designed to link approximately twenty identified poverty areas in both Nassau and Suffolk to existing employment centers. This suburban experiment has experienced somewhat different problems than those conducted in central cities. One interesting addition to the planning process came prior to the inception of service, when a study was made of consumer attitudes toward transit. Home interviews, designed to assess the stated transportation needs of low-income residents, were matched with a survey of employers to determine job availability. The results of these preliminary studies led to a reassessment of some of the assumptions which had been made about the suburban poor.

First, the Long Island poverty areas which had been identified were found to contain only about 16 to 20 percent of the low-income families and welfare recipients in both counties. This finding makes clear the dispersed nature of poverty populations in suburbia. Second, a common misconception that "poor is Black" was noted in a report of the Nassau-Suffolk Bi-County Regional Planning Board. According to the 1960 Census, only one of ten poor families on Long Island was non-white. In light of these findings, the Planning Board stated:

This analysis suggests that approaches to aid the poor in suburbia may have to be much more individualized and personalized than in urban areas where the high geographical concentration and ethnic communality of the poor may allow more comprehensive approaches to the solution of their problems.

With these exceptions in mind, the major characteristics of expected low-income users of new transportation lines were similar to those of target populations in other areas. Auto ownership was lower than in the population as a whole, which on Long Island, presents special difficulties to second workers in a household, even if one car is available. In addition, education and income levels; labor force

participation and skill levels were lower in poverty areas than in the general population.

In all, 22 bus routes were started in both counties during the first two years of the demonstration. By July of 1970, one of these routes was still under Project sponsorship; twelve had been continued by the carriers (all but two of these at a reduced level of service); two had been merged into other routes; and seven were discontinued because of low ridership. Preliminary conclusions during the operation of these bus lines have indicated that the service itself is useful, and that other improvements to public transportation, including schedule coordination with established lines, better routing, and better information to potential users, will result in increased mobility for many of Long Island's low-income workers.

During the later phases of the Long Island demonstration, other factors were stressed, including: better marketing of public transit schedules; more links to the Long Island Railroad; and experiments with jitneys and leased vehicles in areas where the demand for new services exists, but the population is too small to support a regular new bus line. Perhaps the most significant part of the Long Island study however, is that there has been a conscientious effort to evaluate new facilities not only in terms of their costs, but with a full consideration of the social or indirect benefits which result.

One more demonstration project worth reviewing began in April of 1968 in St. Louis. Here, a bus service known as TEMPO (Transportation, Employment and Manpower Provide Opportunities) was established to link the central city ghetto with the Hazelwood area of St. Louis County, about twenty miles to the northwest of the City proper. During the first six months of operation, twenty-seven buses were in operation, but only fourteen buses were retained after this period due to lower ridership than had originally been expected. During the evaluation phase of the experiment, it was found that the current employees of the manufacturing, service, trade and construction firms in the 13 square mile Hazelwood area overwhelmingly used private automobiles or car-pools for their journey to work. The task of project evaluators then, was to examine the impact of the TEMPO NORTHWEST buses on both ghetto residents and employers in the Hazelwood area, in terms of the ability of the line to provide jobs and the value of this service in meeting existing manpower needs. During the evaluation period, though total unemployment in the St. Louis area was a relatively normal 3.5 per-

cent (4.5 percent in the SMSA) one major employer in the destination area experienced heavy cutbacks in hiring. Thus, according to project evaluators Edward Kalaehk and John Goering: "despite propitious economic circumstances in the total St. Louis area, the summer and fall of 1968 was an unusually unfelicitous period for measuring the results of a bus experiment with a Hazelwood terminal zone."

In trying to evaluate the success of the TEMPO bus line, several steps were taken which have not always been utilized in other demonstrations of this type. First, employers in the destination area were interviewed in order to discover how many hires had resulted from TEMPO; how personnel managers felt about the new workers' merits; and whether or not an extended program would be welcomed. Job counselors who worked with TEMPO riders were also interviewed to collect information on job duration; worker stability; and general comments about the new journey-to-work trip in terms of time, cost, and convenience.

In analyzing employer response to the new program, it was found that most firms already had access to an adequate, if not abundant, labor supply. In all, it was estimated that 106 workers were hired by 92 different firms in Hazelwood, and 100 students attended a training program at a large manufacturing establishment during the summer. Thirty-two firms in the employer sample accounted for 96 of the 106 central city workers who had found jobs through TEMPO. Of these 96 workers, 84 quit or were discharged from their jobs during the first year, and only 11 were reported to have retained their positions during this time period. This discouraging record was regarded rather sympathetically by a few employers, who felt that they had not made enough of an effort to insure that special training was available for the lowest-skilled TEMPO riders; that the formidably long bus route was another mitigating factor, and that they would like to try again, starting with pre-employment training and perhaps even sensitivity training for supervisors and other indigenous employees. Asked if the employers would find it profitable to assist in subsidizing such bus services in the future however, only two firms responded positively. Other comments on the results of the program, from the employers' point of view, included a realization that the bus line was only minimally

useful for many new employees, and especially those who were on late shifts. One employer pointed out that the bus schedule resulted in a group of workers arriving either one hour ahead of their starting time, or late for work; and that the trip home allowed this particular shift only 6 minutes to get to the pick-up point which was one-half mile away. Another employer commented that new workers were almost always assigned to the late shift, and that the TEMPO bus which served his plant did not include service during these hours. All in all, it would seem that the TEMPO line was not the ultimate solution for matching ghetto workers with these jobs, at least from the employers' standpoint.

In terms of cost, TEMPO and one other subsidized bus line in St. Louis were able to produce an average revenue credit for the Model City Agency, which supervised the lines, of 28 cents per passenger, even though the one-way fare was 50 cents. The estimated total cost of running both lines for one year was estimated at \$382,400 with \$121,700 allocated for planning and evaluation, \$66,800 for promotional activities, and \$190,900 for bus operations. In comparing these costs with worker earnings, it was found that only 43.8 jobs of one year's duration, would have to be found by the riders to balance off the costs of the program. Considering the quits and firings during the first year, TEMPO did not achieve this duration of employment.

Job counselors who had worked with TEMPO riders during the experiment generally agreed that the program's relatively insignificant impact on the St. Louis economy resulted more from negative attitudes on the part of employers and inefficient service than from the inability of central city residents to get and hold jobs. They felt training and special efforts on the part of employers would have meant the retention of more jobs for TEMPO riders; that they themselves had not been able to create such additional opportunities; and that the bus ride was too long, too expensive in some cases, and not scheduled properly. In the final analysis then, TEMPO riders, employers and project evaluators agreed that other types of transportation should be tried (including jitneys or carpool arrangements), and that pre-employment or on-the-job training must be built into such programs.

CHAPTER 2. JOBS IN THE REGION

To explore the ways in which transportation improvements can enhance employment opportunities of New York City residents it is necessary, first, to gain an understanding of where jobs are now located and what the dynamics of their redistribution are. In economic and social terms New York City is, of course, not a self-contained entity--it interacts daily with the surrounding areas through journey-to-work flows, and over time through migration of both people and enterprises. Therefore, the analysis in this chapter starts from an overview of four fairly concentric geographic areas: The New York Urban Region, the New York--Northeastern New Jersey Standard Consolidated Area, New York City proper, and its economic heart--the Manhattan Central Business District.

Present dimensions and distributions

The New York Urban Region, as defined by Regional Plan Association, encompasses a 31-county area of more than 12,000 square miles in the States of Connecticut, New Jersey and New York. Over eight million jobs and nearly twenty million residents are located here, approximately one-tenth of the nation. Although the Region functions essentially as a self-contained job and housing market (a fraction of one percent of its workers commute across its boundaries), its distant outer areas are only tenuously related to New York City.

Therefore, for the purposes of this report, the Standard Consolidated Area (SCA) is in some ways a more appropriate geographic framework. Defined by the U.S. Census, it covers 17 counties in New York and New Jersey, which encompass 30 percent of the Region's land area, but 60 percent of its developed land and nearly 85 percent of its population and employment.

The City of New York itself, covering 5 of the SCA counties, accounts for roughly 50 percent of the Region's employment and about 40 percent of its population. As Table 6 shows, more than half of the City's employment is, in turn, concentrated in its Central Business District (CBD), defined conventionally as Manhattan south of 60th Street.

The economy of the New York Region is essentially a white collar economy, more advanced in the nature of skills required than the nation as a whole, and less dependent on the expansion of blue collar activities for sustaining future employment growth than most other urban areas. Factory-site manufacturing jobs in the Region number roughly two million; although another half million jobs are production-oriented, occurring largely in wholesaling and warehousing, it is the factory opportunities that represent the largest and most identifiable component of blue collar activity. Factory jobs tend to locate in a more dispersed pattern than total employment in the Region, with a disproportionately larger share settled outside of New York City in the SCA, and outside the SCA in the rest of the Region. The advantages of low-density suburban sites and the ease of access to the Region's rail and highway network foster the location of factory-site employment outside New York City. Nonetheless, 37 percent of the Region's factory jobs remain within the City, where they account for 18 percent of all employment.

Table 6.
The Location of Employment in the Region, 1967.

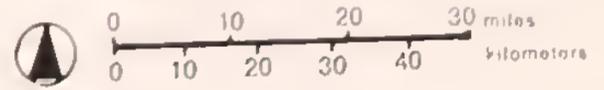
	Total	Jobs (000's)		
		Factory-Site	Office Bldg.	Other
Region Total	8,219	1,976	1,669	4,574
New York -- N.E. N.J. SCA	7,002	1,585	1,522	3,895
New York City	4,125	729	1,125	2,271
Manhattan CBD	2,205	310	860	1,035
Rest of NYC	1,920	419	265	1,236

Source: Regional Plan Association.



Map 9.
Definitions of The New York Region

-  Standard Consolidated Area (SCA)
-  Region defined by Regional Plan Association
-  New York City
-  Manhattan Central Business District (CBD)



Office jobs are more amenable to location in New York City. Indeed, the Region's heavy concentration of office building activities owes its present scale and diversity to the leading role of New York in the nation's office industry. The economies of agglomeration, which facilitate the ease of personal communication and support the range and frequency of services essential to conducting business, are nowhere concentrated to the degree to which they are found in Manhattan. Slightly more than half of all office building jobs in the Region are located in the Manhattan CBD, and two-thirds are located in the City as a whole. In the rest of the SCA, jobs in office buildings comprise 14 percent of total employment as contrasted with 27 percent in New York City, and 40 percent in the Manhattan CBD.

The remaining employment, which to a considerable extent represents residence-related activities, exhibits none of the pyramiding of offices or dispersal of manufacturing. Half of these remaining jobs are located in New York City and 35 percent are in the rest of the SCA, where they account for roughly 55 percent of total employment.

Although New York City accounts for half of total employment, only 43 percent of the Region's labor force reside in it, which leads to heavy commuter flows toward the City. In the SCA as a whole, much of this disparity is erased, even though a margin of net in-commutation persists, with 85 percent of the Region's employment located in the SCA in contrast to 83 percent of the resident labor force. Despite the dependence of the suburban portion of the SCA on the rest of

Table 7.
Estimated Location of the Resident Labor Force in the Region, 1968.

	Total	Persons (000's)		
		White Collar	Blue Collar	Service
Region Total	8,142	4,327	2,819	996
New York - N.E. N.J. SCA	6,720	3,587	2,302	831
New York City	3,485	1,827	1,194	464
Manhattan CBD	260			
Rest of NYC	3,226			

Source: Regional Plan Association

Table 8.
Estimated Distribution of Skill Requirements by Place of Employment in the Region, 1967.

	Total	Jobs (000's)		
		White Collar	Blue Collar	Service
Region Total	8,219	4,527	2,685	1,007
New York - N.E. N.J. SCA	7,002	3,936	2,198	868
New York City	4,125	2,443	1,146	536
Manhattan CBD	2,205	1,385	560	260
Rest of NYC	1,920	1,058	566	276

Source: Regional Plan Association

the Region for a share of its work force, this area in turn exports a larger component of resident labor to jobs in New York City. In 1960, the SCA outside of New York City provided 94 percent of the more than one-half million commuters who held City-based employment. However, not all of the skill requirements met by commuters were in short supply with respect to occupations possessed by New York residents.

Table 7 indicates the skill composition of the labor force by place of residence in the Region, while Table 8 shows, for comparison, the skill requirements by place of employment.

At first glance it appears that more jobs than workers existed in the Region's labor market in the late 1960's. This seeming excess is attributable to statistical differences in definition, namely to a larger portion of resident labor employed in multiple jobs than unemployed at the time. The disparity is not uniformly distributed among the separate skill categories, but concentrated primarily in the white collar sector, while the supply of blue collar skills exceeds employment demand.* These categories of course, are broad occupational groupings within which the match for specific skills may be more or less in balance.

Given the Region-wide surplus of blue collar skills over effective blue collar demand, it is evident, from a comparison of Table 7 with Table 8, that the excess supply does not vary too much between the geographic rings. If anything, it is a little smaller in New York City than on the fringes of the Region, though as will later become apparent, the City's surplus is magnified by disproportionate commutation flows and unemployment rates vis-a-vis the rest of the Region. However, there was a deficit of service skills in New York City, which presumably was filled by in-commutation from the surrounding areas, and, of course, a very large deficit of white collar skills, filled by white collar commuters. The shortage of white collar skills among the resident labor force increases, as one moves from the periphery closer to the center of the Region.

Relatively speaking, the dependence of New York City on the rest of the Region and the SCA in particular, results not from an underemphasis on white col-

* Less than one-fifth of the surplus blue collar skills would have been absorbed by elimination of the year's lag in the comparison of employment and labor force.

lar and service skills among residents of the City, but rather from an over-specialization in these job requirements with respect to the composition of total employment in the Region. Just as the Region is more developed than the nation in the performance of white collar activity, so too New York City and the Manhattan CBD are successively more specialized in this employment than the SCA or the Region as a whole. New York's economy provides 54 percent of the white collar, and a nearly comparable share of the service employment in the New York Region, though all jobs in the City represent exactly half of total regional employment. Skills provided by City residents, however, account for 42 and 47 percent of the white collar and service supply in the Region, in line with the City's total labor force participation which amounts to 43 percent of the Region's total.

Only blue collar activity, as noted above, appears in balance in New York with respect to the share of regional employment (43 percent) and labor force (42 percent) located in the City. Although New York's share of blue collar skills is proportional to its share of total skills in the Region, the propitious match with employment is gained by the relatively small number of blue collar jobs in the City's employment structure. It would thus appear that little requirement for net commutation of blue collar labor to New York City existed in the late 1960's, or at least that a narrowing of the margin of gross inbound blue collar workers over outbound took place over the decade, compared to the level recorded in 1960 by the U.S. Census.

Dynamics of change: jobs

Clearly, the distribution of manpower resources and requirements within the Region cannot be properly evaluated when viewed at any one point in time. Table 9 gives some indication of change in the supply by noting past and prospective shifts in the location of population within the Region. Of the more than two million increase in residents which occurred over the past decade, only 5 percent settled in New York City. Indeed, the long-term prospect for expansion of the City's resident labor force is dim, and not unjustifiably so. Since the mid-1950's, when New York housed half of the Region's population, suburbanization has accelerated more rapidly from the impetus of residential location than employment location. Between 1960 and 1970, fully 62 percent of the Region's population growth occurred in the suburban portion of the SCA and 33 percent took place in the rest of the Region. By 1970, the suburban SCA had achieved a larger po-

pulation than New York City--in part because of the resettlement of roughly two million persons who were former residents of the City or their descendants between 1950 and 1970; only 40 percent of the twenty million inhabitants of the Region now reside in New York City.

Virtually all of the future expansion of the New York Region's population (and labor force, by inference) will occur outside New York City, with increasing emphasis placed on the less developed portions of the rest of the Region. Considerable vacant land for residential settlement in the preferred single-family style, and increasingly in multi-family structures as well, is available in the intermediate and outer portions of the Region, while in New York City, which is expected to gain only a quarter million residents by 1985, marginal additions to the stock of housing can be accommodated on vacant land only in a few outlying sections. The suburban SCA is thus expected to capture three million of the five million growth in regional population, or 59 percent of total, while the rest of the Region will likely gain nearly two million persons, or 36 percent of total. Given these trends, the City's share of total population in the Region is expected to slip to roughly one-third by 1985.

Measured against shifts in population, changes in the location of employment within the Region give indication of probable changes in the pattern of journey-to-work. Before such comparisons can be made, however, it is necessary to first examine recent experience in employment redistribution, in order to extend the apparent preferences for location into the future. The time frame chosen for analysis was a period of relatively full employment in the Region, 1959 to 1967, when changes in the composition of activity and the impact of technology were well underway. For simplicity, the rest of the Region outside the SCA, which accommodated only 18 percent of recent past job growth and is expected to continue exporting workers into the future, will be eliminated from this discussion.

Table 9.
Population Growth in the Region, 1960 to 1985.

	Persons (000's)				
	1960	1970	1985	1960-70	1970-85
Region Total	17,624	19,752	24,700	+ 2,128	+ 4,948
New York - NE N.J. SCA	14,759	16,183	19,350	+ 1,424	+ 3,167
New York City	7,782	7,898	8,150	+ 114	+ 254
Manhattan CBD	557	518		-39	
Rest of NYC	7,225	7,378		+ 153	

Source: U.S. Census of Population, 1960 and 1970, Regional Plan Association

As Table 10 indicates, roughly a hundred thousand jobs a year have been created in the New York SCA over the 1960's. The bulk of new employment favored location in the suburban portion of the SCA, outside of New York City, which increased its share of total SCA jobs from 37 to 41 percent in the span of eight years. Nonetheless, a quarter million jobs were added to New York City, topping four million employment opportunities in the City's economy and accounting for 25 percent of regional job growth, in contrast to 5 percent of population growth. Although exact estimates on the number of jobs in the Manhattan CBD are difficult to ascertain, it appears that the CBD has varied little from a level of two million total employment scored in the wake of recovery from the depression to the early 1960's. Evidence of an upturn in total employment is apparent, however, in the recent concentration of 150,000 new jobs, or 61 percent of the City's total growth, in the CBD between 1959 and 1967.

Indeed, without the CBD's generation of new employment opportunities, it is doubtful that the City's economy would have captured little more than a proportional share of job growth to population growth, for the remaining hundred thousand new jobs which located in New York outside the CBD distributed themselves much in line with the increase of new residents. Queens and Staten Island, which experienced the fastest rates of population growth from 1960 to 1970, also underwent the strongest surge in employment. The Bronx, which grew least in residents, reflected the lowest rate of job increase. But there are exceptions to

these generalizations, namely in Brooklyn and Upper Manhattan. Despite a one percent decline in the population of Brooklyn, and a probable 10 percent decline in Upper Manhattan, both areas enjoyed a modest 3 percent expansion of employment, most likely attributable to their proximity to the CBD and their attraction for jobs which have spilled over or spun-off from the Region's center.

The logic of a resurgence in employment in the Manhattan CBD is found in the changing composition of activity in the New York Region and the SCA. Between 1959 and 1967, factory-site manufacturing grew marginally in the SCA, adding on some twenty thousand jobs. Office activity, however, scored impressive increases by creating 215,000 new jobs in office buildings in the SCA. The remaining employment provided slightly more than 70 percent of the SCA's total gains.

Table 11 indicates that the marginal gains in factory-site employment experienced by the SCA resulted from real declines occurring in New York City, mostly in the Manhattan CBD. The suburbs absorbed the outflow from the City and generated about one-third again the number of new manufacturing opportunities on their own. However, not all of the suburban counties increased factory-site employment over the period. Some, such as Hudson and Essex in locations similar to Brooklyn (which experienced the rest of the City's losses), declined by an average of nearly ten thousand jobs each. Meanwhile, the real suburban growth, of more than a thousand factory-site jobs per year, occurred in more distant counties, which ranked by order of increase were: Nassau, Middlesex, Bergen, Union and Suffolk. In a general sense, then, the more extreme the location with regard to density, the greater was the rate of growth or decline in factory employment. The CBD, which contains 43 percent of the City's factory-site opportunities, dropped 14 percent of total over the period, while losses in Brooklyn or Essex, for example, were more in the order of 7 percent. At the same time, gains in nearby Bergen and Union were exceeded by growth in Middlesex which lies at the edge of the SCA.

More than half of all office building employment growth and roughly a third of other job increases, which accrued to the SCA between 1959 and 1967, located in New York City. The bulk of these opportunities were attracted to the Manhattan CBD, which gained an unprecedented 95,000 new jobs in office buildings and 105,000 other opportunities, a portion of which were office jobs occurring outside of office buildings. The residual gains originated largely from

Table 10.
Changes in the Location of Employment in the SCA, 1959-1967.

	Jobs (000's)			
	Total Employment		Change	
	1959	1967	Absolute	Percent
New York - N.E. N.J. SCA	6,187	7,002	+ 815	13.2%
Suburban SCA	2,309	2,877	+ 568	24.6
New York City	3,879	4,125	+ 246	6.3
Manhattan CBD	2,055	2,205	+ 150	7.3
Rest of NYC	1,824	1,920	+ 96	5.3

Source: Regional Plan Association

Table 11.
Estimated Growth of Employment by Industry in the SCA, 1959-1967.

	Increase of Jobs, (000's)					
	Factory-Site		Office Building		Other	
	Total	%	Total	%	Total	%
New York - N.E. N.J. SCA	21	100	215	100	579	100
Suburban SCA	88	419	101	47	379	65
New York City	- 67	- 319	114	53	200	35
Manhattan CBD	- 50	- 238	95	44	105	18
Rest of NYC	- 17	- 81	19	9	95	17

Source: Regional Plan Association

office-support and major residence-related activities, such as services which provided roughly one-half of total; retail trade which experienced some growth; and non-office government functions. In the rest of New York City, where smaller scale residence-related activities predominate and the increase in office building employment lacked the prestige headquarter character of the Manhattan CBD, the growth of 95,000 other employment opportunities stemmed largely from citywide requirements in services, government, and the transportation, communications and utilities industry. Together with finance, insurance and real estate, these same sectors contributed to growth in office building employment, though this activity in the rest of the City increased by only about 20,000 jobs over the period.

In the suburban portion of the SCA, nearly two-thirds of the growth in office building employment took place in four counties, all of which are close to New York City: Bergen, Essex, Nassau and Westchester. These same counties took roughly half of the remaining employment increase, or twice their portion of total population growth in the suburbs. But only two of these counties--Bergen and Nassau--are noteworthy with respect to gains in factory-site employment. In more distant areas, office gains were overshadowed by factory-site growth, and additions to the resident population generally exceeded increases in employment. As a result, the closer-in counties have become more self-sustaining with respect to their job opportunities, while outlying counties, particularly Suffolk, have had to export increasing numbers of workers to job locations elsewhere in the SCA or the Region.

The largest increment in suburban employment over the period 1959 to 1967 occurred in Nassau County, which added on office building jobs in an amount equivalent to New York City outside the CBD, while the increase in other opportunities was roughly three-fourths of the boroughs' total. Unlike Nassau's office growth, which was singularly undistinguished by major headquarters, Westchester County--and to a lesser extent Bergen--captured a large share of the central offices of major manufacturing firms which relocated to the suburbs from Manhattan. In Essex County, the nature of office growth reflected the considerable concentration of insurance, regional head office, and back office operations which are located in Newark, the SCA's largest commercial center outside Manhattan.

These same growth counties, with the exception of Essex, drew a substantial portion of their remaining

employment increases from the retail and wholesale trade industries, sectors which have grown less rapidly on a Region-wide basis but are abandoning core area locations for suburban ones. These trends are particularly evident in the rest of New York City and Essex County, where trade employment either declined or remained stable over the period. In the development of outlying counties, such as Suffolk and Middlesex, some trade increases occurred, but the rapid growth in population resulted in a much greater emphasis on the expansion of local government and service activities.

Between 1967 and 1985, the SCA is expected to increase in total employment by some 1.6 million jobs. The location of these opportunities will reflect the overall composition of growth and the manner in which population gains are distributed throughout the Region.

Table 12.
Projected Growth in the Employment of the SCA, 1967-1985.

	Jobs (000's)			
	Total Employment 1967	1985	Absolute Change	Percent Change
Total Employment	7,002	8,629	1,627	23.2%
Factory-Site	1,585	1,512	73	4.6
Office Building	1,522	2,192	670	44.0
Other	3,895	4,925	1,030	26.4

Source: Regional Plan Association

As Table 12 indicates, the fastest growing sector of the SCA's economy in the near future will be employment in office buildings. These jobs will grow by 44 percent over an eighteen year period, while other opportunities will merely increase by 26 percent. Factory-site employment is expected to incur real losses, as the location of factories spreads further out into the Region outside the SCA and technology stabilizes the requirement for manpower. Given these trends, and the population growth with which they are associated, it is quite apparent that the suburban portion of the SCA will capture the overwhelming share of new employment. The following Table discusses 1985 employment by industry and location.

Between 1967 and 1985, more than 1.2 million jobs will locate outside New York City in the twelve suburban counties of the SCA, while the City will capture only 360,000 jobs, a lower annual rate of growth than that which occurred in the recent eight year period. Despite this modest increase, New York will experience a marked improvement in its economy through

Table 13.
Projected Location of Employment by Industry in the SCA,
1985.

	Total	Jobs (000's)		Other
		Factory-Site	Office Bldg.	
New York - N.E. N.J. SCA	8,629	1,512	2,192	4,925
Suburban SCA	4,145	931	679	2,535
New York City	4,484	581	1,513	2,390
Manhattan CBD	2,460	215	1,170	1,075
Rest of NYC	2,024	366	343	1,315

Source: Regional Plan Association

upgrading in the nature of opportunities made available. The creation of new office jobs in office buildings in Manhattan will account for nearly seven out of every eight net additions to job opportunities in the City. Factory-site employment will likely continue its downward trend at the same rate in the near future, given the success of public policy measures which will provide incentives for the retention of selected industries within the City. (See pp.99-100). And growth in the remaining employment is not expected to sufficiently offset factory losses, as an increasing share of these other jobs follow population and basic employment to the suburbs.

Thus, growth in office building employment will be in the future, more so than in the past, the mainstay on which the future development of the City's economy rests. Moreover, accommodation of these jobs will likely result in a slightly greater concentration of City-wide employment in the Manhattan CBD. Although some office activities can properly function from sub-center or neighborhood locations in the rest of New York City--specifically, the more clerical or local operations which have fewer linkages with other parts of the economy--more than three-fourths of total will require the benefits of the CBD. Manhattan's manufacturing employers, however, will be under greater pressure to reduce operations or relocate outside the City, than factory-site activities located elsewhere in New York. Only those producers such as printers and garment manufacturers, who require access to office activity or to other establishments in their industry and are capable of operating in the small scale accommodations of manufacturing loft space, will likely remain in the Manhattan CBD by 1985. In the rest of New York City, factory-site employment is expected to decline by 50,000 jobs, or roughly half of the CBD's loss, but continue to provide more opportunities than employment in office buildings. And even though residence-related establishments will probably grow little in employment terms, in the rest of New York City they will still provide more

potential for employment than factory and office activities combined.

By 1985, the New York suburbs will account for nearly half of all employment in the SCA. Less than 6 percent of total growth, however, will take place in existing and relocated factories, which will raise the share of factory-site employment in the suburban portion of the SCA to 62 percent of total. In contrast to the relatively small increase of some 75,000 factory jobs, office building employment in the suburban portion of the SCA will advance by 280,000 positions, in part comprising some of the regional and all of the local requirements of the suburban population growth. Still, opportunities for employment in suburban factories will continue to outweigh those in suburban office buildings.

In the near future, the two core suburban counties of Hudson and Essex are expected to continue losing factory-site employment as they have in the past, and in an amount comparable to the loss expected for the rest of New York City. Similarly Passaic, which has much old industrial development in the southern portion of the County, will incur losses, while other close-in areas such as Union and Westchester will attract relatively little new growth. More than all of the net increase in suburban factory-site jobs will probably be located in Bergen, Middlesex, and Suffolk counties.

To some extent, the location of new office buildings will begin to emulate the longer term trends of factory decentralization. But in the case of office activity, the presence of existing commercial centers and the preference of larger office employers for locations accessible to concentrated clerical pools, will serve to retain office development in closer-in and more densely settled areas. A quarter of the expected increase will likely go to two counties with viable office centers: Westchester and Essex. But by 1985, office growth in more distant Suffolk will outweigh Nassau's increase, while Morris and Middlesex counties will clearly begin to compete with eastern Bergen. Nonetheless, 54 percent of the expected suburban total, or one-sixth of the SCA's entire office building employment in 1985, will probably be housed in the four counties which are core or border areas of New York City: Bergen, Essex, Nassau, and Westchester.

The bulk of new growth in suburban employment will arise, not from office and factory opportunities, but from the trade and service requirements of a growing population base. A gain of more than 900,000 other jobs is expected over the eighteen year period,

some of which will be more closely associated with goods handling--such as wholesale and construction activities--than with direct consumer services. As a result, the impact of remaining employment growth on the future development of suburban economies will be to favor locations midway between areas of office and population increase. In total, the largest growth in suburban employment is expected to occur in Suffolk County over the near future, as overwhelming increases in residence-related activity follow population growth to the area. Second place gains will likely occur in Bergen, Nassau and Westchester, counties which will each experience roughly half of Suffolk's increase and considerably lower shares of total growth attributable to residence-related employment. Among the remaining suburban counties, less developed areas such as Middlesex, Morris, and Somerset will generally tend to capture larger shares of overall employment, while closer-in counties such as Essex and Passaic will offset the potential growth from office activity by declines in factory-site operations. Thus, among the suburban counties with good accessibility to New York, the few which provide a larger measure of opportunity for employment growth in the near future are the very same counties which have traditionally functioned as commuter residences for Manhattan's white collar work force--namely, Bergen, Nassau, and Westchester.

Dynamics of change: labor force

Even though the City's economy is expected to produce relatively few jobs in the future in comparison to the scale of development foreseen in the suburbs, New York will continue to provide more employment opportunities than its resident labor force is equipped to fill, on a strictly numerical basis. When viewed in the context of job requirements, or skills associated with employment growth, this deficit widens as the occupational composition of the City's employment matures more rapidly than the skill qualifications of its residents.

As we have noted, white collar and service jobs accounted for the entire increase in New York City's employment between 1959 and 1967. While blue collar jobs dropped by 33,000, white collar jobs, mostly in professional, technical and clerical occupations, increased by 225,000 and raised the share of white collar employment in the City from 57 to 59 percent of total. Service jobs advanced by 54,000, but remained relatively stable as a share of total, at 13 percent.

Throughout a comparable period, 1960 to 1968, New York City's resident labor force remained virtually constant in size, though its ethnic composition changed substantially. Losses through white out-migration were offset by growth in the Black, Puerto Rican and Oriental labor force, gains that were numerically equivalent to the employment growth in the City. About half the new minority entrants into the labor force had white collar skills. On balance, by 1968 the City's labor pool was somewhat better equipped for white collar occupations: white collar skills advanced from 51 to 52 percent of the City's manpower resources; still it is evident that this improvement in qualifications lagged behind the demand from white collar jobs.

Blue collar occupations of New York City residents declined both absolutely and relatively, but supply in the lower-skilled categories continued to exceed demand. Among skilled craftsmen and foremen, whose supply was already deficient with respect to employment opportunities in 1960, the loss of nearly twenty thousand persons from the resident labor force occurred at a time when the demand for them increased marginally. These divergent trends probably resulted in additions to the stream of inbound commuters. By contrast, lesser-skilled operatives and unskilled laborers comprised the entire surplus of blue collar persons in the City in 1968 and represented two of the occupational categories in which Blacks and Puerto Ricans were more heavily concentrated. Though little more than ten percent of recent expansion in the minority labor force took place in these occupations, their potential for employment within the City was nil. Between 1959 and 1967, the decline in demand for operatives and laborers was greater than the net decline in all blue collar employment and even though the supply of these skills contracted more than the demand, a surplus of some 75,000 participants still persisted by period end. The City's unemployment rolls in 1968 verify their unsuccessful search for employment: roughly three-quarters of the total jobless, or 80,000 persons, possessed blue collar skills.

Persons equipped with service skills, among them maintenance and protective service workers, were more fortunate due to the growth of some fifty thousand service jobs in the City's economy between 1959 and 1967. Even in 1960, the demand for service skills exceeded the resident supply within New York, and though non-whites and Puerto Ricans comprised the growth sector of the City's labor force and have been heavily concentrated in service activities for some time, the margin of demand over supply widened ex-

tensively during the recent past period. Similar to white collar activity, where a match of jobs to resident workers yielded a deficit of roughly six hundred thousand skilled persons in New York by 1968, the growth of service activities met with a short supply of seventy thousand resident skills by period end.

Table 14.
Estimated Growth of Employment by Skills in the SCA, 1959-1985.

	White Collar		Jobs (800's) Blue Collar		Service	
	1959	1985	1959	1985	1959	1985
New York - N.E. N.J. SCA	3,345	5,235	2,116	2,223	726	1,171
Suburban SCA	1,127	2,372	937	1,209	244	564
New York City	2,218	2,863	1,179	1,014	482	607

Source: Regional Plan Association

Table 15.
Estimated Growth of the Resident Labor Force by Skills in the SCA, 1960-1985.

	White Collar		Persons (000's) Blue Collar		Service	
	1960	1985	1960	1985	1960	1985
New York - N.E. N.J. SCA	3,217	4,707	2,340	2,347	734	1,101
Suburban SCA	1,443	2,747	1,081	1,257	279	578
New York City	1,774	1,960	1,259	1,090	455	523

Source: Regional Plan Association

Between 1967 and 1985, six out of every seven new employment opportunities created in New York City will require white collar skills. On the other hand, the demand for blue collar occupations is likely to drop by 131,000 positions, at a decidedly faster annual rate of attrition than was experienced in the recent past. Some of the loss in these lower-skilled opportunities will be offset by a continued expansion of service demand. But the growth of some seventy thousand service jobs will be small compared to the probable demand for 420,000 new white collar workers by the City's economy over the next decade and a half.

While white collar work is expected to represent nearly two-thirds of total employment in New York City by 1985, the development of white collar skills among the resident labor force of the City will advance less rapidly than employment, if trends of the past decade continue. Between 1968 and 1985, the City's labor pool is expected to grow marginally, by less than a hundred thousand persons even though its ethnic composition will change a great deal: Black, Puerto Rican and other minority participation is expected to increase from 28 percent of total in 1968 to 46 percent by 1985. About two-thirds of the new minority entrants can be expected to possess white collar skills,

and several thousand others may equip themselves for blue collar and service activities based on recent past changes in the occupational profile of new participants. But, supplementing this will be an even larger component of middle aged and older workers who will likely carry forward skills of the predominantly blue collar and service orientation developed in the past. Although the remaining white resident labor force of the City will be more than sixty percent qualified for white collar activity, the overall skill composition of the resident labor supply--if present trends continue--will not advance by more than three percentage points to 55 percent white collar. Meanwhile the nature of job growth will increase demand for white collar occupations from 59 to 64 percent of the City's total between 1968 and 1985.

Continuation along this course would clearly intensify the flow of white collar commutation to New York City. By 1985, the demand for some 800,000 white collar skills will conceivably go unfilled by locally available supply, even though the mechanism of double job-holding may expand the City's white collar resources by more than 5 percent. A similar shortage will beset service activities which will require a suburban work force of some 60,000 persons by 1985, to help meet the growth of seventy thousand service jobs over the period. Yet, excesses and unemployment will persist among blue collar labor. These skills are expected to comprise 30 percent of the occupations held by the resident labor force in 1985, down from 34 percent in 1968, but will remain absolutely and relatively greater than the demand for them, which will contribute only 23 percent to the City's total employment. On balance, then, the net surplus of all blue collar skills among residents of New York City can be expected to increase from roughly 50,000 to 75,000 persons over the forecast period, and current deficits in craftsmen and foremen will be erased by skill upgrading over time.

The potential for employment of blue collar labor in the suburban portion of the SCA will attract some of the City's surplus labor, but in general an excess in blue collar skills is foreseen for the Region as a whole, implying continued blue collar unemployment even in periods of a full employment economy. For some time, the resident supply of blue collar labor in the suburbs has exceeded the demand for these skills outside the City and blue collar commuting into New York City has been greater than out-commuting. Although the white labor force of the New York Region is in general departing from blue collar occupations, some

rapidly developing suburban counties with a lower priced housing stock--such as Suffolk and Middlesex--are acquiring new residents with blue collar skills even though they have accommodated relatively few Blacks and Puerto Ricans over the past decade. In addition, core areas such as Essex and Hudson counties, which have received the bulk of the minority influx to the suburbs, are also gaining in resident blue collar labor. The effect has been, on balance, to increase suburban blue collar supply marginally by some 27,000 persons between 1960 and 1968, while the demand for blue collar skills outside the City grew by 115,000 positions.

Despite these changes, the recent past provided relatively few opportunities for City residents to engage blue collar jobs in the suburban areas. It appears that the surplus of suburban skills was not entirely eliminated by the rapid growth in employment but merely reduced to some fifty thousand persons on a net basis. Hypothetically, the decline should have been reflected in a drop in the level of inbound commutation to New York, or conversely in an increase among outbound workers from the City to the suburbs. Although the latter appears to have taken place among semi- and unskilled workers, who are probably on balance now net out-commuting to the suburbs, an unmet demand for craftsmen and foremen among New York's manpower resources apparently increased suburban in-commutation of this skill. Moreover, even though there existed a similar surplus of blue collar skills among residents of both the City and the suburbs, joblessness was appreciably greater for those who resided in the City.

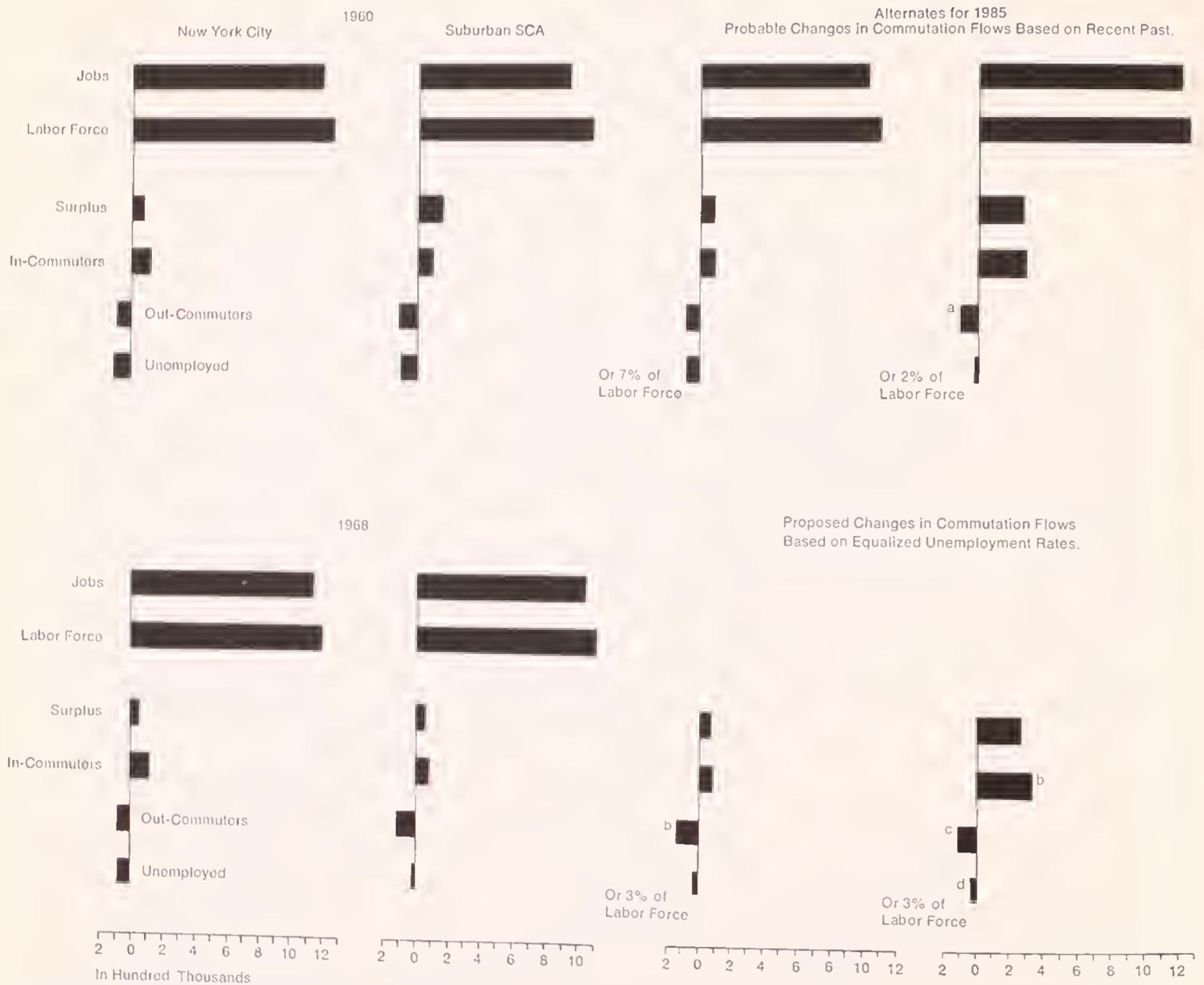
As previously stated, between 1967 and 1985 New York City is estimated to incur a loss of 131,000 blue collar jobs, while the suburbs will attract 156,000. The growth of the suburban labor force is expected to almost keep up with this growth in jobs, which means that the surplus of blue collar skills over blue collar jobs in the suburban portion of the SCA will not be appreciably reduced. However, some of this surplus labor--perhaps 30,000 persons--will be drawn to work in the Region outside the SCA, where factory employment will grow at a rapid pace. This will leave only about 20,000 blue collar persons, or less than 2 percent of the resident labor force in the SCA outside New York City, unemployed. Should the same level of Region-wide unemployment--about 3 percent--be maintained in New York City and in the suburbs, the City would have to export some 40,000 additional blue collar workers to the rest of the SCA or the Region,

leaving 35,000 unemployed. Without this out-commutation, the rate of blue collar joblessness in the City would be about 7 percent.

Clearly, improved access to the suburbs will not ease the problem of blue collar unemployment for the Region as a whole, but merely shift the burden of incidence from falling unequally on City residents. However, in light of the City's huge deficit in white collar skills, which is expected to enlarge over the forecast period, efforts to improve access to blue collar opportunities should be considered a palliative measure, while a more intensive program of skill upgrading is pursued, and shifts in residential patterns are effected. For the New York SCA as a whole, the balance between white collar supply and demand will produce fewer net shortages than in the City, and for the suburban areas there will obviously exist a surplus of skills which will comprise the bulk of white collar commutation to New York. Nonetheless, white collar workers are expected to journey from even further distances, out of the rest of the Region where settlement will take place largely from white collar suburbanization. Despite this labor resource, some 200,000 white collar workers or 4 percent of total in the Region by 1985 must hold double jobs if demand is expected to be fully matched by supply, based on past trends in occupational attainment.

Between 1967 and 1985, the suburban portion of the SCA will attract some 880,000 white collar jobs, nearly two and a half times the level of white collar growth which prevailed between 1959 and 1967 and twice the increase expected for the City over the same period. Even though this growth will result in a further concentration of all suburban jobs in white collar activities, to 57 percent of total by 1985, the demand for more specialized skills in this area will continue to fall absolutely and relatively behind New York. At the same time, the supply of qualified residents will increase by 990,000 white collar skills to 60 percent of the labor force in the suburbs, for a tripling of the growth which took place between 1960 and 1968. Though the City has exported few white collar residents to the suburbs over the recent past, the future will present even fewer opportunities, in view of the proliferation of unmet white collar demand within New York. Rather, the City will have to extend its catchment area well beyond the SCA into the rest of the Region, if its demand for white collar skills is to be filled. Whereas virtually all of the white collar commutation to the City originated in the rest of the SCA over the recent past, as much as 40 percent, or 300,000 workers, may

Chart 1
Changes in the Commutation of Blue Collar Residents of New York City and the Suburban SCA, 1960 to 1985.



a Assumed 30,000 to rest of Region to fill deficit blue collar skills and 90,000 to New York City
 b Includes proposed increase of 40,000 New York City resident out-commuters by 1985 to job locations in suburban SCA
 c Assumed 50,000 to rest of Region to fill deficit blue collar skills and equalize unemployment rates throughout the Region, and 90,000 to New York City
 d Assumed 20,000 unemployed in rest of Region

have to be attracted from the rest of the Region to meet the increased requirement by 1985. Clearly, an alternative to this is accelerated development of white collar skills among New York City residents.

Service workers in the Region will be faced with much the same option for employment. Most of the increase in service demand is expected to originate in the suburban SCA in the future, as it has in the recent past, but the growth of resident service skills outside the City is forecast to keep pace with employment demand. Thus, a net in-commutation of service skills from the suburban portion of the SCA to the City will be sustained over the future, on the order of 40,000 persons, but the balance of New York's deficit, or some 20,000 jobs, must be met by transporting workers from the rest of the Region, if the share of double job holding among City residents is not considerably increased instead. A summary of the redistribution of employment and labor force in the period discussed is provided by Table 16.

Present pattern of opportunities by small area

For the overwhelming majority of City residents, the opportunity for employment lies within the New York City job market. As we have seen, however, these jobs are heavily concentrated in white collar activities and will require an increasingly sophisticated level of skill attainment over time. Nonetheless, a substantial share of them at present and in the near future can be qualified for by a high school or business school education. These lesser-skilled white collar opportunities which occur in clerical and sales occupations (except for headquarter related sales in in-

dustries such as manufacturing and finance or insurance), accounted for roughly half of all white collar employment in New York in 1967 and are expected to increase by some 170,000 jobs by 1985. In addition, many service occupations, particularly in medical or consumer-related services, can be attained without a high school diploma, though in some instances licensing upon completion of publicly approved coursework is required. In other fields of service activity, such as private or municipal protective services, a high school education is essential and training is provided. Still, service jobs are generally classified among the lower-paying and lesser skilled employment activities and their increase over the near future will provide some 70,000 additional opportunities in New York.

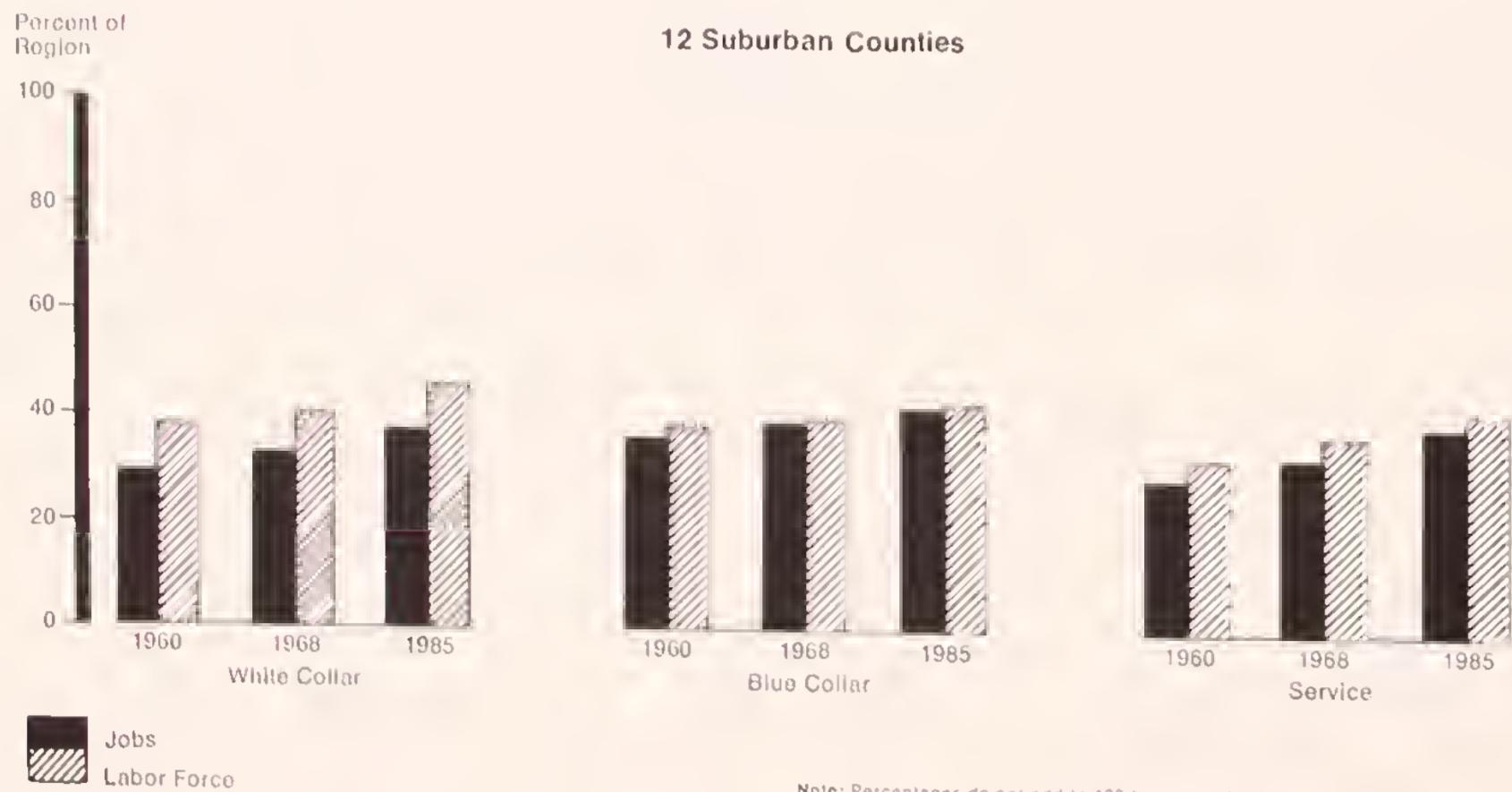
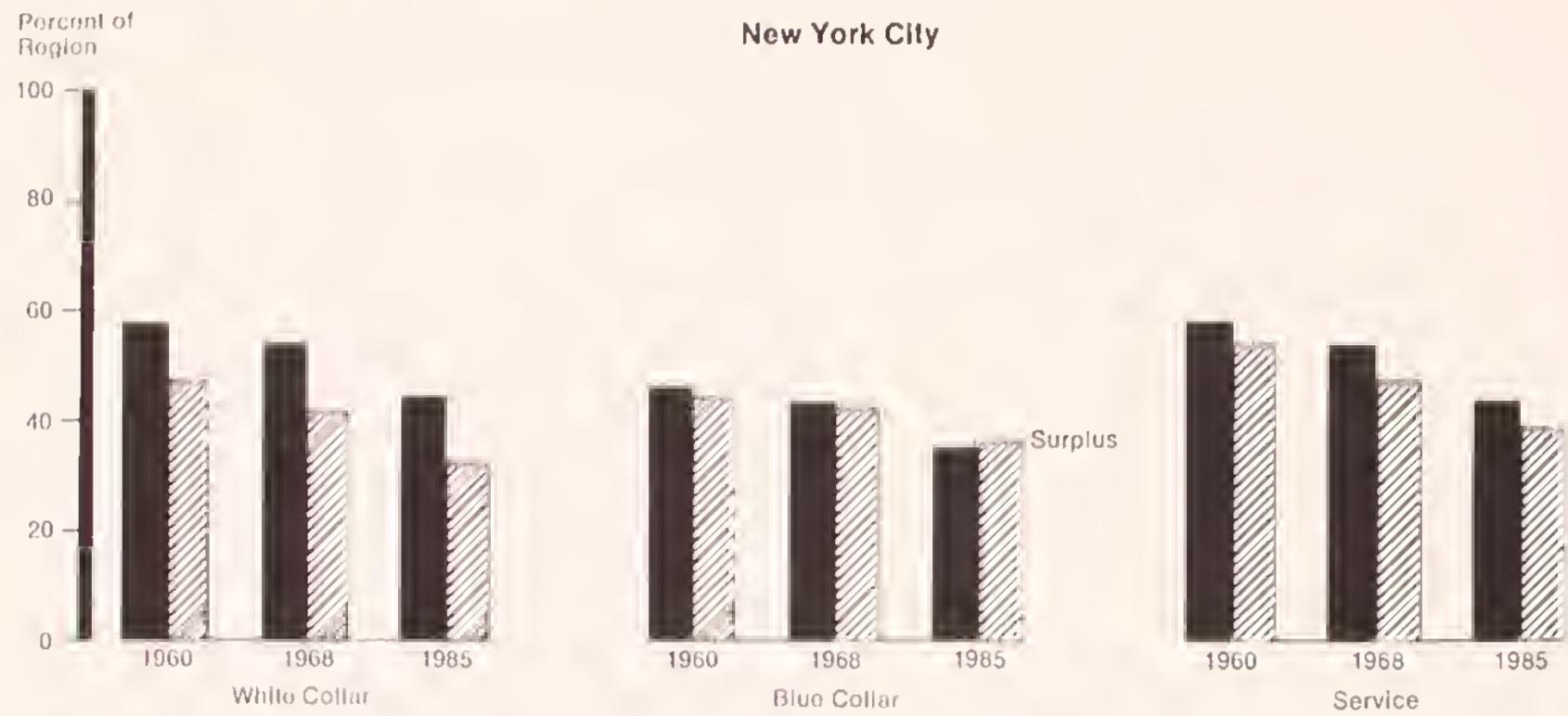
Traditionally, however, the opportunity for employment of low- to moderate-skilled persons has been dominated by blue collar activity. Although these jobs as a whole slipped to a second place rating behind clerical and sales work in New York between 1959 and 1967, they continue to represent a substantial source of demand, particularly for the male labor force. An average of 60 percent of the lesser-skilled white collar and service positions are generally held by females, while more than three-quarters of the blue collar jobs are filled by men. Entrance to blue collar occupations is ordinarily made through on-the-job training or prescribed apprenticeship programs. Although a high school education is preferred, in the semi- and unskilled operative and laborer ranks completion is not mandatory. In general, the formal education requirements for blue collar occupations are less stringent than for the lower skills in white collar work, but entrance to blue collar activities is often more impeded

Table 16.
The Changing Distribution of Employment and Labor Force in the New York Region, 1960-1985.

	(as percent of Region)					
	5 Counties NYC	12 Suburban Counties Resl SCA	14 Outer Counties Resl Region	5 Counties NYC	12 Suburban Counties Resl SCA	14 Outer Counties Resl Region
	White Collar Jobs			White Collar Labor Force		
ca 1960	58.0%	29.4%	12.6%	47.4%	38.5%	14.1%
ca 1968	54.0	33.0	13.0	42.2	40.7	17.1
1985	45.5	37.7	16.8	32.4	45.4	22.2
	Blue Collar Jobs			Blue Collar Labor Force		
ca 1960	46.0%	36.6%	17.4%	44.4%	38.1%	17.5%
ca 1968	42.7	39.2	18.1	42.4	39.3	18.3
1985	35.3	42.0	22.7	36.7	42.3	21.0
	Service Jobs			Service Labor Force		
ca 1960	57.3%	29.0%	13.7%	53.2%	32.6%	14.2%
ca 1968	53.2	33.0	13.8	46.6	36.8	16.6
1985	42.0	39.0	19.0	37.9	41.8	20.3

Source: Regional Plan Association

Chart 2
Jobs and Resident Labor Force in New York City and 12 Suburban Counties as a Share of the Region's Total, 1960, 1968, 1985.



Note: Percentages do not add to 100 because 14 outer counties are not shown.

by union regulations while the subsequent development of skills, through work experience or apprenticeship training, can eventually bring higher-paying jobs.

Although blue collar jobs are expected to decline absolutely by some 130,000 positions in New York between 1967 and 1985, considerable job openings are expected to occur as presently filled positions are vacated by deaths and retirements over time. It is outside the purview of this study to undertake the detailed estimation of replacement demand for labor, but some notion of the level of openings anticipated in this declining sector can be gained from the analysis of the New York State Department of Labor, published in the report Manpower Directions, New York State, 1965-1975. The Department estimates that some 27,000 blue collar jobs will annually become available in New York City, from deaths and retirements of previous job holders over the period 1965 to 1975. The bulk of this demand, or 66 percent of total, will fill semi- and unskilled operative and laborer positions, while an average of 9,000 craftsmen will annually be recruited to replace departed skilled workmen. Extending the projection rates beyond 1975 to produce a longer-term requirement consistent with the forecast period of this study, 1967 to 1985, yields an annual average of some 20,000 to 25,000 blue collar opportunities which will open up in New York City over the near future.

Even though this projection represents a considerable turnover of personnel, it does not alter the magnitude of final imbalance between blue collar supply and demand which results from the matching of employment forecasts with projections of the skill characteristics of an available labor force. To some extent, however, these replacement opportunities can alter the volume of commutation (on a gross in- and outbound basis while the net difference remains the same), if all blue collar positions vacated in New York by suburban commuters are captured by City residents. In the subsequent discussion which reviews the present pattern of employment opportunities by small area, it is useful to consider the spatial distribution of blue collar work as a guide to the location of blue collar job openings in the City.

The following series of maps (Map 10 through Map 13) present the location of four major occupational groupings by place of work in the New York Northeastern New Jersey SCA as of 1969. From a residential point of view, the maps portray the relative degree of access to a range of employment opportunities for lesser-skilled and lower-income persons. The method of presentation was based on a computation of

the density of employment in particular skill categories by small area, ranked by order of density and arrayed in twenty percentile groupings to depict job concentrations in the SCA. The darkest shade represents the area within which 20 percent of the specific jobs are concentrated; this and the next darkest account for 40 percent; the former two plus the next darkest 60 percent, and so on. The lowest percentile of density, that is zones in the 80 to 100 percent range, is not shown because of the obvious lack of opportunity they present, with regard to both density and location. In New Jersey, the employment zones consist of municipalities, while in New York postal zones were used. Sales occupations were omitted because the data did not provide the extensive detail necessary to delete jobs with higher-skilled requirements, while operatives and laborers were combined separately from craftsmen to distinguish blue collar jobs with essentially lower pre-employment qualifications. Lastly, the remaining employment which occurs in professional and managerial occupations was excluded because these jobs are clearly outside the scope of immediate opportunities for low-income workers.

Perhaps the most prominent feature in the locational distribution of skill demand in the SCA is the prevalence of job concentrations in New York, exclusive of a small share of suburban development, until past the mid-range, or 40 to 60 percentile, of all jobs. This of course reflects the historical pattern of job development in the New York area, which emanated from the center and settled in nearby corridors defined by land and water transportation routes. The highest concentrations of suburban employment appear with regularity in older cities which were independently established, such as Newark, Paterson, Passaic, Yonkers and Mount Vernon, or along major highway and rail axes when occurring in more newly developed suburbs, such as Nassau County. In general, however, the distribution indicates the tenacity with which older areas of settlement have retained employment up to this time. With the overwhelming portion of future growth destined for suburban locations, however, the ranges of job concentration will tend to spread, encompassing further areas as the overall profile of density flattens in the SCA outside the Manhattan CBD.

By type of skill, there is some locational variation manifested within the SCA. The pattern of clerical demand, for example, shown in Map 10 is the most concentrated one, with 40 percent of total in the Manhattan CBD. The mid-range of density, 40 to 60 percent, encompasses the rest of Manhattan, adjacent

portions of the South Bronx, a major portion of the industrial belt of Brooklyn including Downtown Brooklyn to Gowanus, Long Island City in Queens to Flushing and including La Guardia Airport, and several commercial centers in New Jersey, such as Newark. The next layer of density, 60 to 80 percent of total, picks up clerical opportunities both in ghetto areas, such as Bedford-Stuyvesant and Brownsville to Jamaica, and emerging suburban office strips, such as the Bergen County complex along the Palisades. A further filling-in of the City is also apparent at this level of concentration, including Flatbush, the Flatlands, and Kennedy Airport, but extensive portions of eastern Queens are left untouched while the first inroads to Nassau and Westchester are made. In the New Jersey suburbs, a spread of development northwestward from Newark to Paterson and southward to Elizabeth and Linden is accompanied by further extension of clerical demand through older cities of Hudson County and centers farther out, such as New Brunswick and Plainfield.

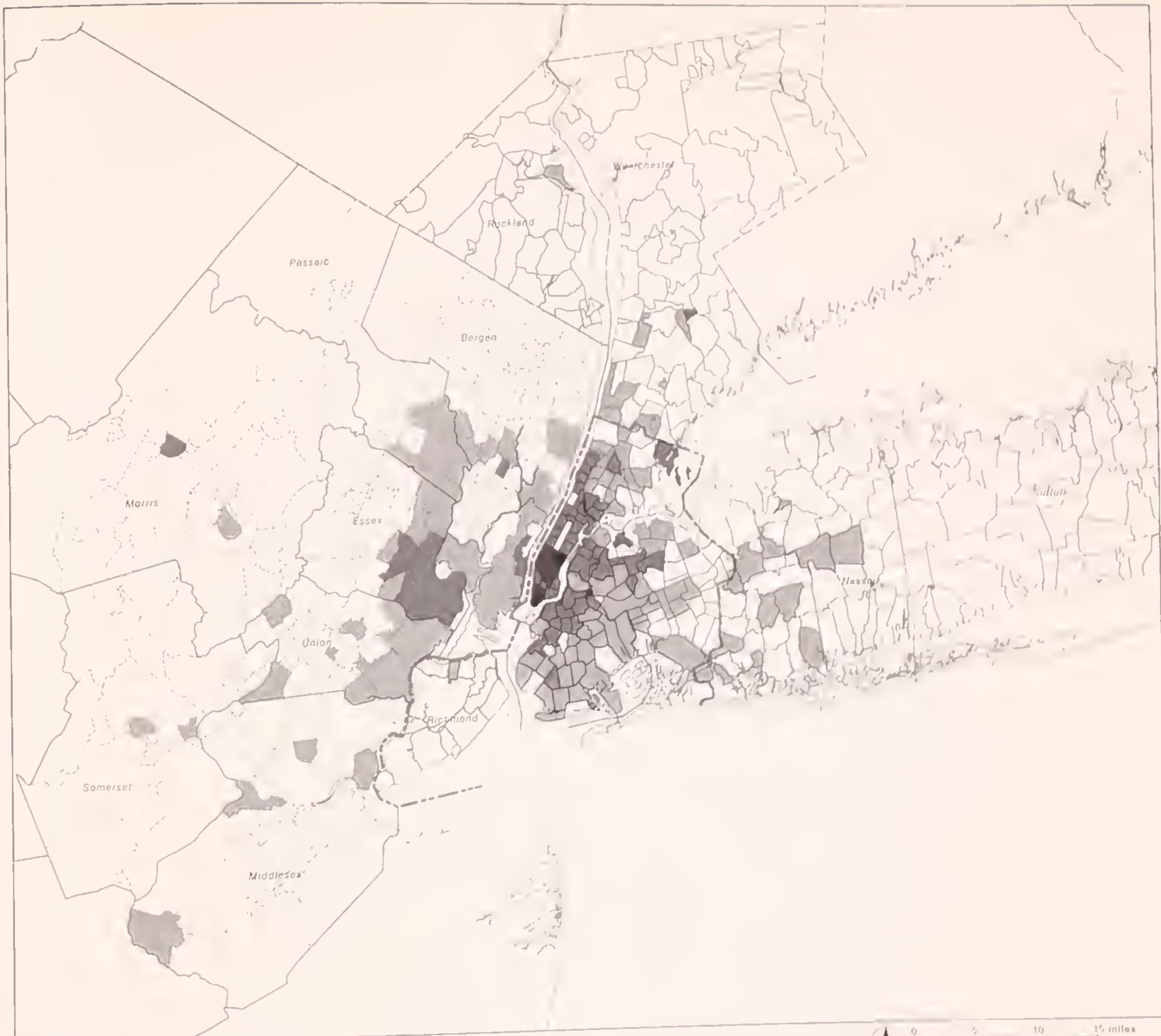
Service occupations shown on Map 11 are also highly concentrated in Manhattan, where over 40 percent of them are located; but the pattern of service demand in the mid-range of development extends further into suburban areas touching Nassau and Westchester counties. This mid-layer also encompasses the rest of Manhattan, but bypasses some of the more industrialized sections of Brooklyn to focus on residential areas like Bedford-Stuyvesant, Crown Heights, and Flatbush, or commercial areas such as Coney Island and Sheepshead Bay. In the Bronx, the entire Grand Concourse area is included, while in Queens, Long Island City, Woodside, La Guardia and residential areas such as Forest Hills, Kew Gardens or Richmond Hill provide a comparable density of opportunity. In the range of 60 to 80 percent of all service jobs, the most noteworthy concentrations appear in New Jersey, Westchester and Nassau, though some filling-in of lower-income areas such as Brownsville, East New York and South Jamaica occurs within the City.

In the blue collar sector, job opportunities for higher-skilled craftsmen shown on Map 12 appear to be slightly more dispersed within the SCA, than those for operatives and laborers indicated on Map 13. As is to be expected, however, Manhattan accounts for a considerably smaller share of this activity than of white collar or service work, with employment concentrations which contain 20 to 40 percent of jobs reaching into both New York and New Jersey suburbs. For the

rest of the City, the concentrations of both craft and operative/laborer employment are quite similar in their heavy emphasis on the waterfront industrial corridor which stretches from Long Island City in Queens, through Greenpoint and Bushwick, to the Bush Terminal in Brooklyn. In part this area is quite accessible to residents of Bedford-Stuyvesant, but the eastern extension of craft employment from Jackson Heights to Flushing is somewhat more remote. Elsewhere in New York, positions for operatives and laborers tend to be more concentrated in the South Bronx, while a more dense pattern of opportunity for craftsmen exists in Harlem. In the range of 40 to 60 percent of all blue collar jobs, older industrialized cities in the suburban portion of the SCA come into prominence. Places such as Newark, Paterson, and Passaic are represented in both instances, while at the same time craft opportunities tend to develop further out in the SCA, appearing at a comparable density in New Brunswick or as an extension of an initial clustering in Nassau around Garden City and Mineola. Suburban opportunities for operatives and laborers, on the other hand, adhere more closely to core area locations, particularly in Teterboro and the New Jersey riverfront communities of Hudson County.

In New York City, this range of density provides somewhat fewer concentrations of employment for craftsmen than for operatives and laborers. Opportunities for the latter can be seen to extend from Bedford-Stuyvesant and East Flatbush through to Jamaica, Queens, while solid bands of employment from Woodside to Flushing and Morrisania to the Westchester border have developed in northern Queens and the Bronx. Craft employment is located in much the same area but to a lesser extent, while more remote sections of the City, such as Auburndale, White Stone, and Parkchester, provide craft opportunities at a comparable density.

Past the mid-range of density, job opportunities in the City for craftsmen are largely confined to a southern band bordering the Lower Bay and Jamaica Bay, from Bay Ridge to Kennedy Airport, while across the Queens line in Nassau County a considerable development of employment stretches from New Hyde Park south through Valley Stream and east below the Long Island Expressway nearly the entire width of the County. Farther out, Suffolk County and portions of Westchester in the north and bordering on Long Island Sound, as well as Mariners Harbor on Staten Island, appear in this range. But the proliferation of job opportunities for craftsmen is perhaps no-



Map 10.
Clerical Employment in the New York SCA, 1969

Areas containing

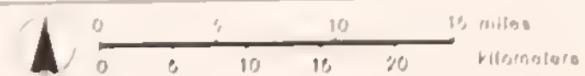


of all clerical employment

(by Postal Zone in New York, by Municipality in New Jersey)



Map 12.
Skilled Blue Collar Employment in the New York SCA, 1969



Areas containing

■ 20 percent	■ 40 percent	■ 60 percent	■ 80 percent
--------------	--------------	--------------	--------------

of all skilled blue collar employment
 (by Postal Zone in New York, by Municipality in New Jersey)



Map 13.
Semi- and Unskilled Blue Collar Employment in the New York SCA, 1969
 Areas containing



where greater in the suburbs than in New Jersey. Meadowland communities such as Kearny, North Bergen, and Carlstadt share in this employment together with other close-in areas such as Palisades, Fairview, Ridgefield, Clifton and Fair Lawn. From Elizabeth south, including Perth Amboy and Plainfield, opportunities exist at a comparable density.

Jobs for operatives and laborers in the City, at the lower range density, extend to Sheepshead, Canarsie and Flatbush in Brooklyn. In Queens, similar opportunities appear in Jamaica and St. Albans, as well as in Flushing and Whitestone. In the Bronx, areas of such employment extend across the City line to Pelham and New Rochelle, but in contrast to craft opportunities, little development takes place farther north in Westchester County. Similarly, suburban Long Island presents fewer opportunities for operatives and laborers, than for craftsmen, though the pattern of location is much the same. In New Jersey, the focus of development represents largely a filling-in between Paterson and Newark, encompassing such communities as Clifton, Bloomfield, Nutley, and the Oranges, while closer to New York, Hackensack, Fair Lawn, Kearny and Jersey City, are developed to a comparable density. Similar to craft employment, these opportunities also radiate southward along the New Jersey Turnpike but the area encompassed is somewhat less extensive.

More than an adequate supply of clerical, service, and craft positions exists within the City, under periods of full employment, to engage all of the qualified resident labor force. Only among the lesser-skilled blue collar ranks of operatives and laborers, can meaningful assistance be given to City residents to secure employment outside of New York. Yet the distributions of employment shown in the previous maps indicate that for a large percentage of low-income areas in the City lesser-skilled employment opportunities are to be found located within the same zone of residence. And opportunities for operatives and laborers appear to fair best with respect to coverage of low-income areas because of the preponderance of these jobs throughout Manhattan, Brooklyn and the Bronx, where more than 80 percent of the lower-income zones are located. All of Manhattan residents in low-income areas are immediately accessible to this employment under the 60 percent range of density, while several zones in Brooklyn and the Bronx are covered by concentrations in the 60 to 80 percentile. But five low-income areas in Queens, more than half of all such zones in the borough, are somewhat

removed from these opportunities, more so those located in the Rockaways than in the South Jamaica area.

In contrast to 90 percent of the low income areas with reported concentrations of lesser-skilled blue collar employment, 84 percent of the City's total contain craft opportunities to some degree. However, roughly the same proportion, or slightly more than three-quarters, comprise locations with higher density concentrations of activity, falling largely in the 20 to 60 percentile range which clearly exceeds that of many of the competing suburban clusters. The areas lacking immediate opportunities are primarily in Queens (South Jamaica, St. Albans, and the Rockaways representing two-thirds of the borough's low income zones), Manhattan (Lower Manhattan), and the Bronx (East Tremont).

The distribution of clerical and service employment settles in roughly 80 percent of the low income areas of the City. Queens again is most deficient with respect to coverage and the same general areas prevail as those lacking immediate employment opportunities. Several low-income areas in Brooklyn appear for the first time, particularly industrial areas with little service employment and Coney Island which is quite removed from clerical activity. A few zones in Upper Manhattan and Harlem show a lack of immediate clerical or service jobs but, as previously noted, the first 40 percentile in the SCA's total is concentrated in its entirety just south of the area in the Manhattan CBD.

Despite the apparently greater degree of accessibility which the location of lower-skilled blue collar employment provides to lower-income workers residing in the City, the sheer size of the labor force equipped with operative and laborer skills exceeds the number of opportunities available within New York. On the other hand, clerical, service, and craft positions must import workers from the suburbs to meet the level of current demand. To some extent, accessibility and perhaps more important, participation in the labor force of residents equipped with the latter skills, can be improved within New York. It is impossible, however, to predict in what manner this may alter their unemployment, which in the full employment year of 1968 was a low 2 percent. Effective measures can be taken, however, to assist a portion of the lesser-skilled blue collar population, which experienced an unemployment rate of 8 percent in 1968, to gain access to suburban concentrations of employment. Over half of these jobless operatives

and laborers residing in the City, or 40,000 persons, were conceivably without work because lack of affordable transportation to the suburbs, or knowledge of job openings in New York, kept them from effectively competing in the employment markets. (Among these same skills the level of suburban unemployment was appreciably lower, in the order of 3 percent).

Both in the present and the future, however, the potential for exporting blue collar workers to the suburbs is not so great as to support a major investment in transportation. Rather, the extent of service should be dependent on prominent clusters in the pattern of suburban factory development, so as to minimize overall access costs while providing opportunities to secure and maintain jobs for a fairly large share of the employable. Map 14 indicates the areas of recent manufacturing growth in the suburbs, based on a record of firms which moved or were newly established over the period 1959 to 1968. Some of the activity represents a turnover of firms in previously occupied factory space, for which a record of on-site firm losses, had it been available, would clearly have indicated. The companion maps of New York City (Maps 15 and 16) portray both aspects of change, namely the growth of firms from new establishments or relocations and the loss of firms from closing or outmigration. But unfortunately, a complete catalogue of activity was not available for either the City or the suburbs. This is apparent in a comparison of City change which indicates virtually a cancelling of loss and gain despite a known decline in factory-site employment.

Nonetheless, the maps present new insights to the issue of providing access to suburban, and City, concentrations of blue collar activity. The suburban map in particular is more suggestive of the future direction of growth, by indicating new employment clusters which are clearly more decentralized from the City than the pattern of existing blue collar employment. The extension of activity to the eastern Nassau border, as well as the heavy concentration of new firms in the Town of Babylon in western Suffolk, illustrate this trend as well as the projection of factory-site job growth discussed earlier. On the other hand, intrusion into the Meadowlands, as well as growth in the industrial communities of Bergen County and the port area of Newark, suggest the retention of some manufacturing employment in locations more accessible to New York.

Within the City, the influx of new manufacturers to the Manhattan CBD has been offset by a comparable loss of firms. For some industries, such as apparel,

this turnover reflects merely the re-establishment of activity under a new company name or, in general, the ease of entrance and exit associated with center-oriented industries which have lower capital commitments. In the other boroughs, activity is quite prominent in the industrial corridor from Long Island City to Gowanus, but only the more northern area from Long Island City to Bushwick shows an appreciable net gain. The emergence of an industrial concentration bordering on Jamaica Bay, from the Flatlands to Kennedy Airport, indicates on balance only a marginal increase in the number of establishments, but a general eastward thrust of manufacturing location in the City (from this area through South Jamaica to the Queens line) suggests a closer affinity with concentrations of low income people presently quite inaccessible to blue collar employment.

For blue collar activity in the Region as a whole, the two patterns of location expressed by the previous series of maps explain the distribution of job openings or current vacancies. Job openings in the labor market reflect the need for replacement of personnel in existing firms, portrayed by the first series which depicts the present settlement pattern of employment, and for recruitment of personnel in firms which have grown, been newly established or relocated, as portrayed by the second series. However, the final pattern of current demand is not readily apparent, even though the relative emphasis on either source of demand by locality can be inferred from a comparison of the map series. Moreover, the only source of documentation on current vacancies, namely the various state Employment Service offices, maintains a procedure of processing unfilled job openings which is too prohibitive for a research compilation of data by small area in the Region.

We have therefore undertaken a mail survey of firms in prominent City and suburban concentrations of manufacturing employment in order to assess the present potential for transporting blue collar workers to available employment opportunities. Map 17 indicates the location of surveyed firms, including non-respondents. The criteria for firm selection were threefold: size of firm (50 or more employees), wage rates (above average industry production pay); and location (generally a density of production facilities capable of supporting public transportation and ordinarily within reach of an existing rail or subway stop). Although some 1,400 firms were canvassed, nearly a quarter, or 325 firms, responded with a total employment of 52,000 jobs. Table 17 provides information on

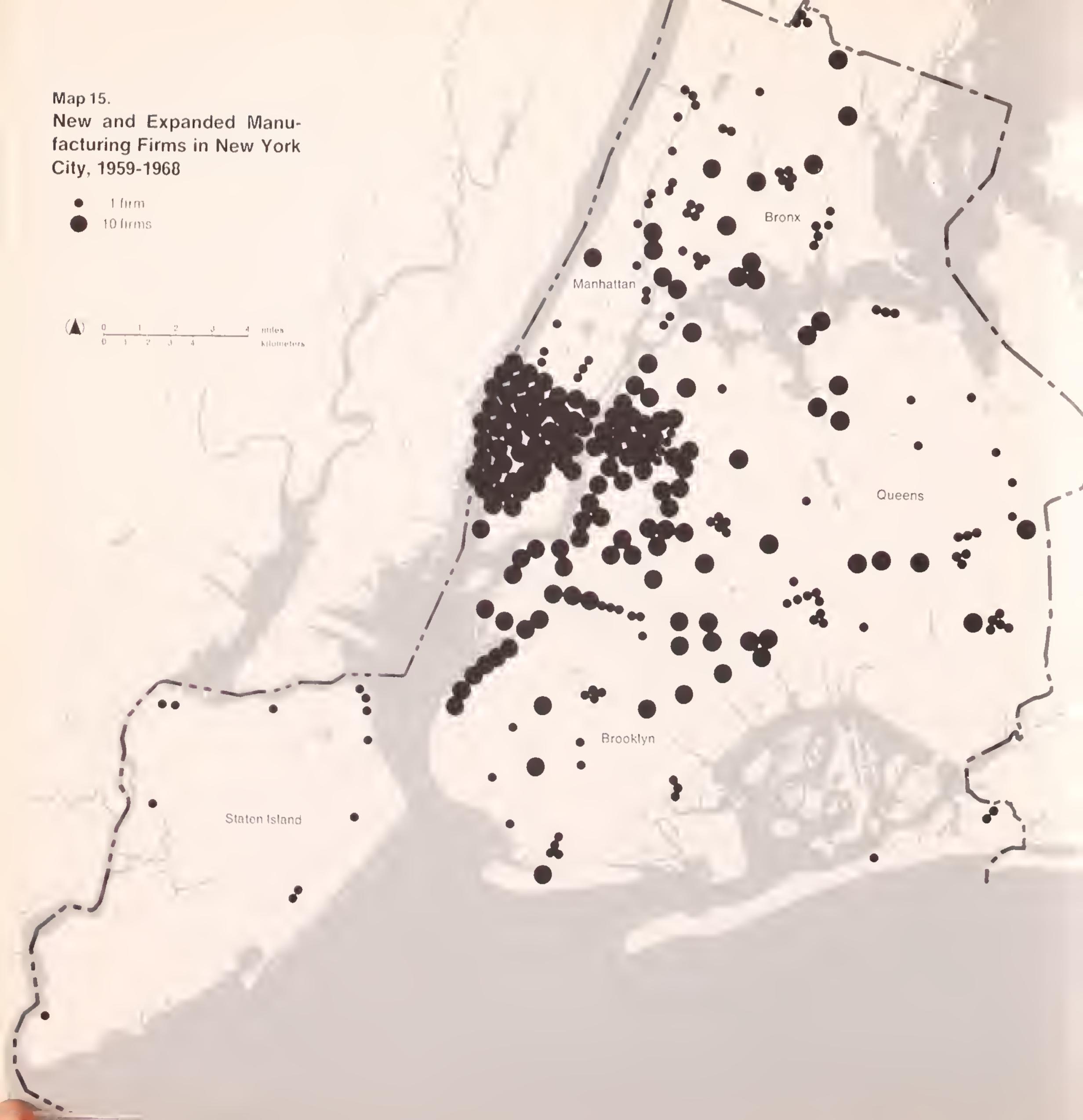


Map 14.
 New and Expanded Manufacturing Firms in the Environs of New York City, 1959-1968

- 1 firm
- 10 firms

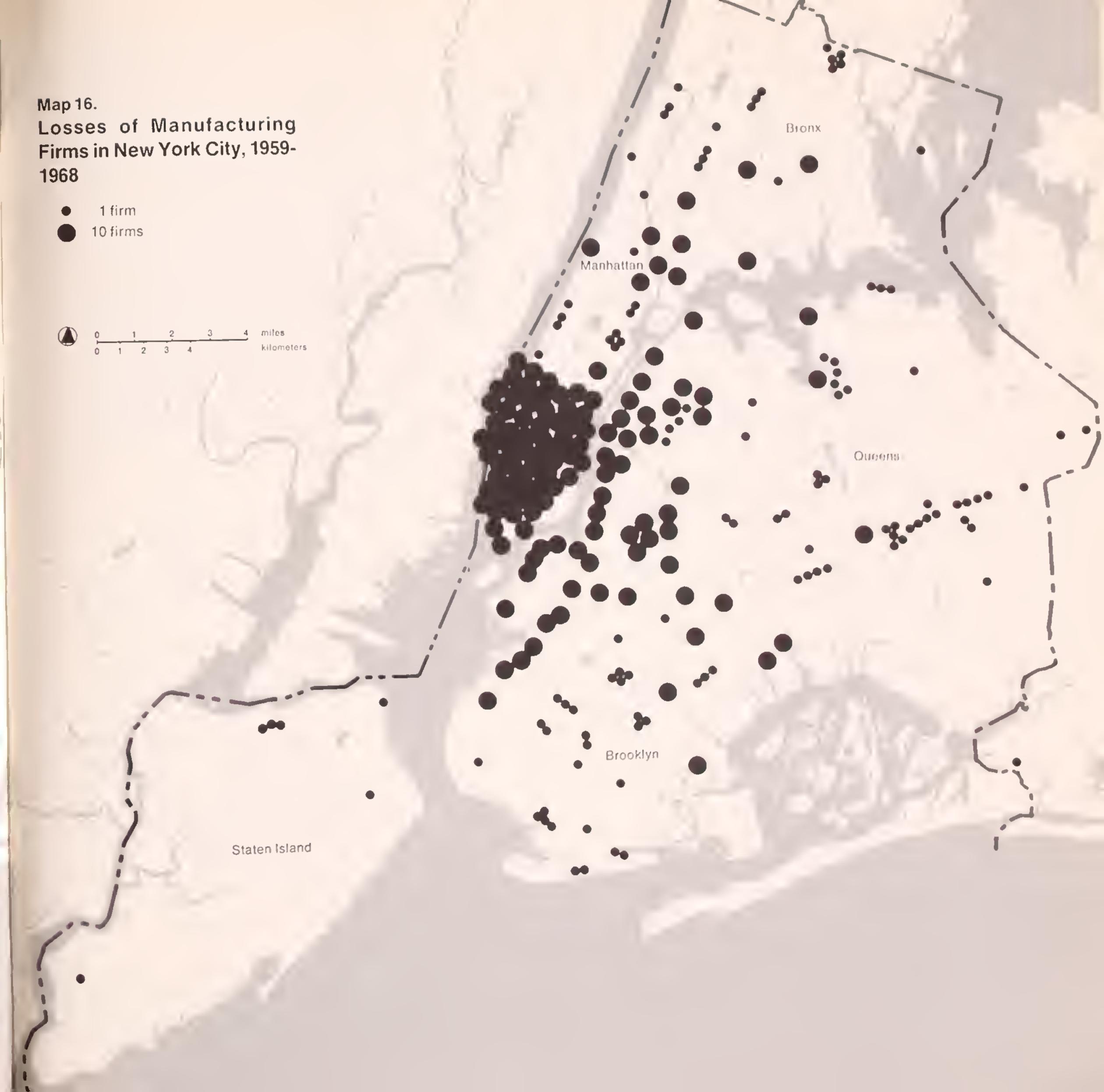
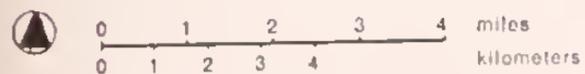
Map 15.
New and Expanded Manu-
facturing Firms in New York
City, 1959-1968

- 1 firm
- 10 firms



Map 16.
Losses of Manufacturing
Firms in New York City, 1959-
1968

- 1 firm
- 10 firms



selected firm characteristics by locality, including the rate of current (at the time of the survey in Spring 1970 - Spring of 1971) and average expected vacancies per month.

As Table 17 indicates, roughly 1,200 job openings were reported at the time of survey, for a sample vacancy rate of 2.3 percent, and 800 opportunities (68 percent of total) were in production work. Had normal economic conditions prevailed at the time of canvassing, it is estimated that some 2,000 opportunities would have been available in the firms, or close to 4 percent of their total employment. Under these conditions, labor shortages would have reflected a disproportionately greater demand for production help (73 percent of total), since some two-thirds (66 percent) of all employment in reporting firms consists of blue collar and service personnel. Under either current or normal conditions, however, the distribution of vacancies to total employment does not appear to bear a constant relationship by small area. At the time of survey, vacant positions as a percent of total

ranged from a high of 8.5 percent in South Brooklyn to less than one percent in Jamaica, Mahwah, and more distant portions of Nassau County, suggesting that the more accessible places had more vacancies. Surprisingly, also, the higher vacancy rates which prevailed outside the City were in areas with direct rail access to New York, such as Garden City-Hempstead, Westbury, and White Plains which coincidentally were also localities or adjacent areas of suburban poverty concentrations. Firms accessible only by car, bus, or longer rail trips, such as those in Port Washington, Plainview or Glen Head, had a contrastingly low level of openings. In general, the City pattern of vacancies reflected the density distribution of total blue collar employment with more highly developed areas such as South Brooklyn, South Bronx, and Long Island City reporting a current rate of unfilled openings above or equal to the sample mean, while more outlying or lesser developed sections of the City, such as Jamaica and East New York, had disproportionately low levels of immediate opportunity.

Table 17.
Employment Opportunities in Firms Surveyed by Locality, 1970-1971.

Locality	Firms	Employment	Current Openings		Average Openings		Vacancy Rate	
			Total	% Prod'n.	Total	% Prod'n.	Curr.	Ave.
Brooklyn								
South Brooklyn	26	2,684	227	91%	196	91%	8.5%	7.3%
Williamsburg-Greenpoint	36	8,458	157	82	454	89	1.9	5.4
East New York	4	485	7	53	23	77	1.4	4.8
Bronx								
South Bronx	15	1,980	48	92	73	88	2.4	3.7
Queens								
Long Island City	20	5,363	117	77	307	89	2.2	5.7
Jamaica	3	616	2	—	4	—	.3	.6
Flushing	1	69	—	—	—	—	.0	.0
Nassau								
Garden City-Hempstead	5	500	32	88	15	80	6.4	3.0
Rockville Center	3	584	11	—	20	20	1.9	3.4
Plainview-Hicksville	7	2,332	9	72	21	74	.4	.9
New Hyde Park	1	170	na	na	na	na	na	na
Westbury	3	340	17	62	13	77	5.0	3.8
Port Washington	3	657	13	85	27	78	2.0	4.1
Glen Head	3	1,640	2	—	36	70	.1	2.2
Inwood-Howlett	3	935	2	100	19	89	.2	2.0
Rest of County	80	7,600	178	52	na	na	2.3	na
Suffolk								
Farmingdale	29	1,633	55	91	na	na	3.4	na
Westchester								
Mount Vernon	15	935	16	75	na	na	1.7	na
White Plains	15	2,593	98	9	na	na	3.6	na
Bergen								
Hackensack-Teterboro	43	6,293	132	58	na	na	2.1	na
Mahwah	10	5,998	51	51	na	na	.9	na
TOTAL	325	51,665	1,174	66%	(2,000)	(73%)	2.3%	3.9%

Note: () estimated based on partial reporting
Source: Regional Plan Association



Map 17.
Surveyed Manufacturing Firms in the New York SCA

☐ Locations of 235 surveyed firms (see p. 200 for questionnaire).

Under normal conditions, these relationships would appear to vary somewhat from the pattern at the time of the survey, which was influenced by higher unemployment and lower job turnover. While the vacancy rate for the sample as a whole is expected to increase, and more so for production opportunities than white collar, the responses by small area indicated that unfilled openings would probably grow more rapidly in the City than in the suburbs. This can be explained by the fact that blue collar openings in New York overwhelmingly represent replacement of manpower on jobs previously held within the firm, at a rather predictable rate. In the suburbs, however, opportunities are more likely to be associated with employment growth, not only in existing production facilities but also in newly established or relocated firms. As a consequence, the rate of normal suburban job openings is understated by a sampling of existing firms. Nonetheless, the data provide some useful insights for the present and near future. The first consideration is one of uniformity. Expected normal vacancies are more comparable within the City and the suburbs than the current pattern of job openings. With the exception of outer Queens, the selected industrial areas of the City generally report normal unfilled openings in the 4 to 6 percent range of total employment; in the suburbs, vacancies settle in the 2 to 4 percent range. However, the more developed areas such as Garden City and Westbury, which have disproportionately high rates of vacancy now, indicate a lower probability under normal conditions; and the less accessible centers of employment, such as Plainview, Port Washington, and Glen Head (among the few which did report normal vacancies), indicate a probable rise in the level of openings under conditions of full employment. Thus the data do suggest some influence of accessibility on the ability of outlying industries to effectively compete for labor when economic conditions are good. Moreover, if the data were amplified to reflect the requirements of newly established or relocated firms, it is possible that the rate of job vacancy in outer suburban areas would increase to one commensurate with that of the inner city.

The firm survey also elicited responses to employment related characteristics, such as mode of transportation, wage rates, and manpower training. Table 18 summarizes major transportation differences apparent in the City and suburban job market.

As is to be expected, the majority of City workers arrive by modes other than automobile (predominantly subway and bus), while suburban car use is twice as

high as in New York City (88 percent in contrast to 44 percent). Clearly, these ratios vary within the areas: outer Queens is more like the suburbs (nearly three-quarters of the workers arrive by car to selected firms in Jamaica and Flushing), while Mount Vernon and Rockville Center, which are closer-in and older suburban centers, have roughly the same proportion of car users as the City. With these exceptions, and the very low percentage recorded for South Brooklyn (21 percent) as well as the inordinately high portions to outer Farmingdale (96 percent) and Mahwah (99 percent), the remaining areas in both the City and the suburbs are representative of the group averages.

Roughly 60 percent of the work force of suburban firms are drawn from residences in the same county as job location, and another quarter of the employees from other suburban counties or outside the Region. Combined, these shares are nearly equivalent to the portion of suburban workers who arrive by auto (88 percent), while the remaining 15 percent who commute from New York City are comparable in share to those who journey to work by public transportation. However, many City residents require automobiles to reach suburban employment destinations (particularly those destinations which are further removed from New York), while transit ridership by suburban residents may replace some auto usage in closer-in counties where the density of development supports a finer network of bus service. In portions of Nassau County, for example, less than 10 percent of employees are City residents while 12 percent or more arrive by modes other than car; in Farmingdale, Suffolk, however, 15 percent of the work force is drawn from the City and less than 4 percent of total do not travel by car.

Table 18.
Transportation Related Characteristics of Firms Surveyed in New York City and the Suburbs.

Estimated Percent of Employees	Concentrations In	
	New York City	Suburbs
Arriving by Automobile	44%	88%
Difficulties in Recruiting as a Result of Inadequate Public Transit		
Yes	49%	46%
No	51	54
High Turnover as a Result of Inadequate Public Transit		
Yes	30%	22%
No	70	78
Frequent Lateness as a Result of Inadequate Public Transit		
Yes	59%	36%
No	41	64

Note: As a percent of respondents to specific questions
Source: Regional Plan Association

Inadequacies in public transportation were held to influence labor shortages through recruitment difficulties by roughly half of the City and suburban firms. An even lower share (but with a slightly greater disparity between City and suburban firms) reported high turnover of personnel as a result of transit deficiencies. Frequent lateness in job reporting appears, however, to be a factor strongly associated with the condition of City transit and markedly less so with that of suburban transit. Under 30 percent of suburban firms indicated absenteeism to be a serious problem and of these less than 20 percent attributed it to transportation difficulties. Within the City, the concentrations of firms most prone to respond positively to all transit-related aspects of labor shortage were in the South Bronx and Jamaica, while in the suburbs, for example, this was true of more centralized concentrations, such as Garden City and West-

bury. Roughly one-fifth of the sampled suburban firms arrange car pools for employees and 14 percent provide some form of transportation to work, but no discernible pattern by location appears in the provision of these compensatory services.

Table 19, shown below, arrays the profile of earnings associated with reported job openings in New York City and the suburbs. It should be noted at the outset that the job markets differ from one another in a major respect: namely, the range of distribution in payments for each level of skill is much broader, and therefore less peaked, in the City than in the suburbs. To some extent, this reflects a more diverse composition of demand within the skill categories of the City, but it may also be simply a more reliable response as a result of heavier reporting on this question by New York City firms. However, the rank ordering of median earnings by separate occupational group in both

Table 19.
Distribution of Annual Earnings Associated with Reported Job Openings in New York City and Suburbs.

	New York City	Concentrations in Suburbs	Total
Professional, Managerial			
Under \$10,000	10.5%	—	0.0%
\$10,000—\$15,000	52.6	90.0%	65.5
\$15,000 and Over	36.9	10.0	27.6
Total	100.0	100.0	100.0
Median Range	\$12,5—\$15,000	\$12,5—\$15,000	\$12,5—\$15,000
Clerical, Sales			
Under \$5,000	11.1%	0.5%	10.7%
\$5,000—\$10,000	64.8	71.4	66.0
\$10,000 and Over	24.1	19.1	22.7
Total	100.0	100.0	100.0
Median Range	\$5—\$7,500	\$5—\$7,500	\$5—\$7,500
Craftsmen			
Under \$5,000	7.1%	—	4.0%
\$5,000—\$10,000	67.9	92.3%	75.6
\$10,000 and Over	25.0	7.7	19.5
Total	100.0	100.0	100.0
Median Range	\$7,5—\$10,000	\$7,5—\$10,000	\$7,5—\$10,000
Estimated Average Earnings	\$8,475	\$8,205	—
Operatives, Laborers			
Under \$5,000	42.3%	34.5%	40.2%
\$5,000—\$7,500	43.6	58.6	47.7
\$7,500 and Over	14.1	6.9	12.1
Total	100.0	100.0	100.0
Median Range	\$5—\$7,500	\$5—\$7,500	\$5—\$7,500
Estimated Average Earnings	\$5,545	\$5,400	—
Service Workers			
Under \$5,000	59.1%	41.7%	52.9%
\$5,000—\$7,500	22.7	58.3	35.3
\$7,500 and Over	18.2	—	11.8
Total	100.0	100.0	100.0
Median Range	Under \$5,000	\$5—\$7,500	Under \$5,000
Estimated Average Earnings	\$5,230	\$5,020	—

Source: Regional Plan Association

the City and the suburbs is a quite reasonable reflection of the essential differences between skills in both productivity and pre-employment qualifications. And interestingly, the City's margin over the suburbs in average annual earnings, which were estimated from the detailed survey responses, appears greater for each occupation but is still greater for those in which the City must import workers on a net basis, such as the white collar or service occupations.

If the sample data are taken to be fairly representative, then the earnings outlook attributed to current vacancies poses several options for the employable production worker. Clearly, a larger share of the City based positions are in the upper-income range (which contributes to larger overall average earnings) but the probability of avoiding lower-paying blue collar jobs (those under \$5,000 annually) is greater in the suburbs than in New York. Similarly, areas of the City in which firms indicated a more favorable wage structure are those with either a low level of current openings (Williamsburg, East New York, or Jamaica), or reputed transit inadequacies (South Bronx or Jamaica). Firms in South Brooklyn which reported the highest vacancy rate also reported a wage structure for craftsmen, operatives and laborers which is considerably lower than the citywide average. Although the share of higher-paying jobs in this area is roughly comparable to, or above, suburban averages, an inordinate portion of the remaining positions are concentrated in the below \$5,000 category.

The benefits of securing a better-paying job in the suburbs appear to be equally offset by certain locational costs to the inner city resident worker. Highest wages across-the-board are paid by firms in the Mahwah area, the most distant concentration surveyed and one in which the turnover of employees is relatively high but unfilled openings are currently reported below 1 percent. Virtually all of the craft positions available in Mahwah secure wages in excess of \$7,500 annually, while jobs for operatives and laborers ordinarily start above \$6,000 per year. Locations which are more accessible to New York that do report vacancies on the high side for the suburban sample (4 to 6 percent of total employment) contain an inordinate share of low-paying opportunities, particularly for operatives and laborers. In Garden City, for example, 60 percent of the semi- and unskilled jobs pay under \$5,000 and in Westbury or White Plains the wage structure is similarly less favorable than in the City. However, reported opportunities for craftsmen in the Garden City area carry a pay scale equiva-

lent to that of Mahwah, but this instance is unique insofar as a high level of immediate opportunity correlates with a high earnings potential among the sample firms.

The greatest share of better-paying suburban jobs for all levels of blue collar skill are to be found in areas which presently report a low level of unfilled openings. Nassau County manufacturers in Plainview-Hicksville, Port Washington, and Rockville Center, for example, nearly compete with the pay scale of those in Mahwah, but current vacancies in these firms are only slightly more promising, at 2 percent or less of total employment. Nonetheless, normal vacancies may run from 3 to 4 percent, as existing firms anticipate or as further development takes place, particularly in the Plainview area. Opportunities are more plentiful in Farmingdale (Suffolk), but no earnings advantage whatsoever exists to attract workers to this rapidly growing but more distant area. Firm responses there indicate that over three-quarters of the semi- and unskilled personnel earn less than \$5,000 per year without overtime. Also, when compared to firms in other New York or New Jersey locations, particularly those which are more accessible to the City such as Mount Vernon or Hackensack, the Nassau County market as a whole appears to provide a heavier concentration of the mid-range blue collar opportunities or those which tend to differentiate the earnings potential of the suburbs from the City.

Lastly, the sample firms were surveyed with respect to on-the-job training and the scale of compensation paid during the period of training. Overall, the response indicated a roughly equal split between those firms which did or did not provide training programs for semi-skilled workers, with 49 percent of total responding positively. Suburban firms indicated a slightly greater margin (52 percent) provided such programs, but the scale of compensation paid to trainees in the suburbs showed a marked improvement over that in the City. Nearly three-quarters (71 percent) of the suburban respondents indicated that program trainees were carried at the regular wage scale and only 7 percent at a minimum scale, in contrast to 35 percent of sample firms in the City which paid trainees at either a regular or minimum rate. Special scales or other means of compensation were maintained by 22 percent of the suburban respondents and 30 percent of those in the City.

Although the survey procedure as a whole has provided the employment analysis with relatively few hard facts on which to base a program of matching the

employable blue collar resident of New York with currently unfilled job openings in the City and the suburbs, it has nonetheless contributed insights to the job market and guided us in the selection of some general areas which appear to bring a greater return on transportation investment in the form of access to remunerative and sustaining job opportunities. Before the areas of opportunity are defined, however, it is worthwhile to summarize these insights, profiling blue collar vacancies in the Region as they would appear to be arrayed under normal economic conditions. Furthermore, the pattern of opportunity in white collar and service work--activities in which City residents are not competitively disadvantaged with respect to overall demand--will be portrayed by the location of two major employers, offices and hospital, in order to enlarge the field of focus for transportation recommendations.

Theoretically, distance from the center of a labor market should influence the structure of wage rates through the cost of spatial friction in the competition for a limited supply of skills within the Region. But as the sample has indicated, this pattern may not be clear-cut, even though there is little evidence to explain departures in terms of imperfect communication on the part of employers or job-seekers in the job market. However, there is a general tendency for the share of lower-paying jobs to decline with increasing distance from the center, when measured as the percent of firms with wage offerings under \$5,000 at all levels of blue collar skill. But offsetting this trend is a mixed response on the periphery of the sample area where firms either offer high earnings and incur low vacancies, or conversely, provide little wage incentive to attract workers and experience relatively greater labor shortages. And though the highest overall share of low-paying opportunities are to be found in the City, there exists a disproportionately large share of high-paying jobs (and a dearth of middle-range openings) in the same skill category, as well.

In opposition to a generalized profile of increased earnings potential from the center outward, there appears to be a downward trend in the portion of unfilled openings in total employment, though at some point in suburban development, vacancies may rise again. Clearly, these tendencies are interrelated to an extent, but the portion of job vacancies by area can also be explained in other terms. In the City, virtually all the job openings are for replacement purposes as no net growth in blue collar employment has taken place and positions are vacated by deaths or retirements from

an older labor force. In more developed suburban areas, job vacancies are relatively not as plentiful as in the City, largely because the industrial base has matured and little growth occurs from expansion, new establishments or firm relocations, while at the same time the labor force is somewhat younger and more stable. In less developed suburban areas, however, virtually all the job openings are associated with industrial growth, and under prosperous economic conditions they can be expected to proliferate as expanded or newly established firms seek labor and relocated manufacturers fail to bring a full complement of former employees with them from the City.

The selection of optimum areas of job opportunity in the suburbs for blue collar residents of the City should be dependent on a consideration of trade-offs between the earnings potential and the level of available openings, factors which bear in part a countervailing relationship to distance from the City. Clearly, no area exists in which both factors are equally favorable. But it would appear that the main focus of transportation service to the suburbs should be one of shorter distance delivery to established industrial areas where a moderate portion of remunerative job opportunities exist. For even though a low level of job vacancy will likely prevail in the areas, the density of industrial development may be sufficient to amount to a sizeable labor requirement. And then transporting workers farther out into the suburbs at a greater cost, to low-density areas, may meet with better-paying opportunities but conceivably more competition for the available jobs, or else a relatively greater labor shortage but little or no earnings advantage.

Primary consideration should be given, however, to absorbing available blue collar opportunities within the City. Even though a larger share of these unfilled positions carry with them lower earnings, transportation costs to the worker will be less and for the most part, he will follow established transit routes to industrial areas of the City. Although a sufficient number of blue collar opportunities cannot be marshaled within New York to fully employ the surplus resident blue collar force, matching as many employable persons as possible to available jobs will not only temper the decline of production activity within New York, but reduce the requirement for exporting blue collar residents to the suburbs, as well.

The issue of linking lower-income white collar and service workers to jobs which require their skills differs from the approach to blue collar opportunities

In two major respects. First of all, there is no capacity constraint on the number of opportunities available in New York for City residents adequately equipped with these skills. And secondly, because these jobs constitute the growth sector of the City economy, it is not necessary to canvass employers for openings generated by a replacement demand for labor, but merely to focus on locations where white collar and service growth have taken place. Under normal economic conditions, the new positions created in these sectors can more than adequately absorb the growth in the resident labor force.

Map 18 depicts the location of office space and hospitals—uses which signify the source of demand for a large and concentrated share of the lower-skilled white collar and service job growth in the New York SCA. As is apparent from the map, the largest concentrations of activity are in Manhattan: in the case of offices, more than half (57 percent) of all floor space in the SCA and over three-quarters of all office jobs in the City; and in hospitals, roughly three-eighths of all facilities in New York, but closer to half of all hospital jobs. Outside of Manhattan, offices tend to cluster in smaller downtowns (such as Newark and Downtown Brooklyn), attenuate through older residential and industrial areas (such as Harlem and Long Island City), or disperse to highway oriented locations in newer suburban settlements. But at least two-thirds of the SCA's office jobs in 1963 were readily accessible by public transportation, with 55 percent of space located in the Manhattan CBD and 11 percent in the sub-centers or clusters defined on the map. Recent office construction to 1970, however, has tended to favor the Manhattan CBD and dispersed locations to the detriment of City and suburban sub-centers. Although hospital jobs are not as concentrated in Manhattan, as are office positions, a goodly share of those located in the other boroughs are in or accessible to concentrations of low-income workers. Moreover, new facilities such as the mental health or family care centers, or improvements to existing facilities which are scheduled by the public sector for these boroughs, are largely sited in low-income areas, such as Bedford-Stuyvesant, Brownsville, and the South Bronx. These additions are expected to determine the location of much of the anticipated growth in health care employment outside of Manhattan.

The results of our employment analysis suggest areas of job opportunity which should be the focus of present transportation services for low-income persons. Obviously, as employment locations shift

within the Region, target areas for future service will differ from those to which remedial, short-term improvements should be directed. But equally apparent is the option to develop or accelerate other programs as a substitute for transportation service in the future, such as manpower training for white collar work or construction of low-income housing in the suburbs accessible to outlying concentrations of blue collar jobs. The future growth of employment by small area will be discussed in the subsequent, and last, section of this chapter. Map 1 in the Recommendations section at the front of the report defines the selected areas of opportunity for blue collar employment in the City and suburbs at present. Although the need for improving low-income accessibility to concentrations of white collar and service work outside New York is not at all a worthwhile consideration given the abundant demand for these skills within the City and the normally low rate of unemployment which occurs among qualified residents, some measures can be undertaken to assist those residing in more remote parts of New York to reach the prime concentrations of white collar and service employment in the City, which are also defined on the map.

Under normal economic conditions, it is estimated that some 40,000 unemployed semi- and unskilled blue collar residents of New York could be placed in job openings throughout the SCA. This goal represents neither an exhaustion of the pool of surplus operative and laborer skills within the City (roughly 3 percent of total rather than 8 percent would remain jobless), nor an unreasonable level of job vacancy in semi- and unskilled employment (less than 3 percent of total positions unfilled). It does, however, represent a realistic target against which to measure the effectiveness of public transportation programs. Roughly half of the job openings are to be found in New York City and the other half in the suburban portion of the SCA as follows: Long Island, 20 percent; Northern New York, 10 percent; New Jersey, 70 percent. Assuming the distribution of job vacancies discussed earlier, the lower-skilled blue collar employment concentrations defined on Map 1, and selected for purposes of density and accessibility, represent a respective 73 and 21 percent of the estimated City and suburban openings. The following table provides the estimates by small area.

Although the rate of unemployment for craftsmen residing within the City is ordinarily low and there are indications that net in-commutation from suburban areas has increased over the past decade to meet the requirements of City employers, there is nonetheless

Map 18.
Office Space and Hospitals
in New York City

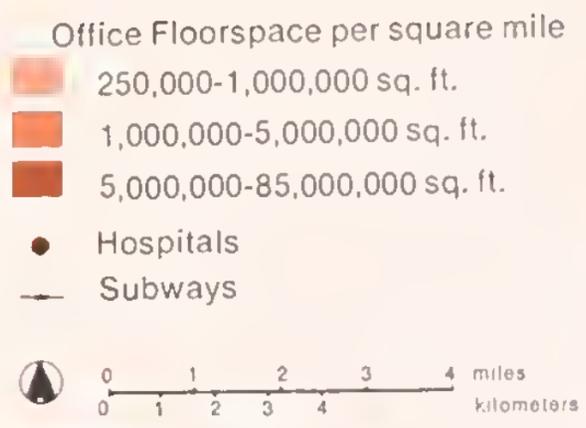


Table 20.
Estimated Number of Expected Job Openings for Operatives and Laborers in the Selected Concentrations.

County of Concentration	Existing Employment of Operatives and Laborers	Estimated Job Openings
New York (Manhattan)	351,600	9,500
Brooklyn-Queens	150,000	4,050
Bronx	39,800	1,070
Nassau-Suffolk	40,000	1,100
Hudson	57,400	1,150
Bergen-Passaic	90,750	1,850

Source: Regional Plan Association

an annual opening of opportunities in New York, associated with the replacement demand for labor, that is nearly sufficient to absorb the roll of skilled jobless under normal economic conditions. Roughly three-quarters of these vacancies, or 6,500 positions for craftsmen, are expected to occur alongside semi- and unskilled opportunities in the selected City concentrations. Transporting employable craftsmen to suburban areas is not recommended for the near term, when the demand for these skills within the City will continue to exceed the resident supply.

The focus of improved accessibility for lesser-skilled white collar and service workers should also be exclusively one of intra-city movement. However, it is doubtful whether improvements to transportation service will measurably affect unemployment in these skill categories which are essentially fully employed in the City and the Region. And from the perspective of the employable, the search for available opportunities in clerical, sales or service work is much less burdensome or costly because existing white collar and service work is more heavily concentrated in Manhattan, than are blue collar opportunities, and new positions are clearly more plentiful, opening from growth as well as turnover. Transportation improvements may, however, induce new entrants to the labor force as well as improve accessibility from remote areas or through neighborhood concentrations which provide residence-related opportunities. Map 1 also indicates several concentrations of white collar and service employment which in total dominate the current job market, have received at least a proportional share of recent growth, and are estimated to provide respectively 72 and 62 percent of City-wide demand in new white collar and service work.

Future potential of small area concentrations

The second section of this chapter discussed the growth of employment in the SCA and the locational preferences of specific industries which are expected

to manifest themselves in a shifting distribution of activity between the City and the suburbs by 1985. Although New York is not anticipated to decline in total employment, but rather to grow moderately from the expansion of white collar and service jobs which will offset further losses in blue collar activity, the suburban portion of the SCA will gain the bulk of new employment from all the factory-site increases, 42 percent of the office jobs, and 88 percent of the residence-related activities. These trends will affect the pattern of employment by small area in the following manner. The Manhattan CBD, and to a lesser extent the white collar and service sub-centers of the City, will attract virtually all of New York's growth industry, while concentrations of factory-site employment will thin-out from continued job attrition as well as City policies to establish new industrial districts.

In the suburbs, the impact of employment growth is less clear. Sub-centers of white collar and service activity, such as old established downtowns, can capture a significant share of the new office and institutional growth slated for the suburbs; but the costs of higher-density location, broadly conceived, must clearly be made more favorable, for the pattern of suburban location has generally been one of dispersal. Suburban blue collar growth, however, will unalterably spread further into the Region, organized to some extent in new industrial parks adjacent to rail and highway routes. This last section of the chapter will identify the magnitude of expected change in selected employment concentrations of the SCA.

The Manhattan Central Business District. Of the more than one-third million increase in employment which is expected to occur in New York City between 1967 and 1985, some 255,000 jobs or more than 70 percent will accrue to the Manhattan CBD. After a long tradition of stable employment, the Region's center is expected to build on recent past gains and approach two and one-half million jobs by 1985. The composition of this growth will marginally advance the share of total City jobs located in the CBD, from 53 to 55 percent, as well as office building jobs, but significantly reduce the portion of factory-site opportunities, from 43 to 37 percent, and to a lesser extent other employment. Although more than all of the growth in Manhattan will stem from the expansion of office activity which is expected to increase demand from 860,000 positions to 1,170,000 by 1985, a modest growth in other, related employment should also take place. But nearly one hundred thousand factory-site

jobs will move out of the CBD, accounting for 64 percent of New York's expected loss in production employment over the near future. By 1985, over half of all persons employed in the Manhattan CBD will be office workers (including those in non-office buildings), in contrast to little more than a quarter throughout the SCA as a whole.

The merit of accommodating further growth, and density, in Manhattan is a much debated issue. But without the growth of office employment in New York, and specifically the impetus for growth which is derived from Manhattan's fertile office economy, total employment in the City would clearly stagnate. Increases in residence-related employment, including local office employment, would little more than offset factory-site declines. However, facilitating office growth can result in moderate increases in total employment elsewhere in New York City. Assuming that some routine office work generated in the CBD can be spun-off to the boroughs, the rest of New York will experience a moderate increase of 104,000 jobs between 1967 and 1985. Factory-site employment declines of some fifty thousand positions will be surmounted by the growth of population serving activities and office work, which will equally contribute to the expected employment gains in the rest of New York City over the near future. And of the nearly 80,000 job increase anticipated in office buildings outside the CBD by 1985, public action has been taken to cluster nearly half in two major sub-centers, Downtown Brooklyn and Jamaica. Investigation of a third area, the concentration of commercial activities along Fordham Road in the Bronx, is currently underway.

Sub-centers in New York City.

1. Downtown Brooklyn. The official development plan for Downtown Brooklyn, implemented in the first phase by the Brooklyn Center Urban Renewal Project which was approved in 1970, will ultimately bring a doubling of floor space and employment to the core area of this borough. The non-residential components of the plan call for roughly ten million square feet of new office space, one million square feet of retailing area, 40,000 additional jobs, and higher education facilities to accommodate 25,000 students. By 1975, plans for several office structures will be realized by the completion of over one million square feet of space; thereafter, an additional three million square feet slated for the Brooklyn Center Project may reach completion by 1985, housing 20,000 workers in all or half of the target employment growth.

2. Jamaica Center. As the transportation hub of eastern Long Island, Jamaica has been identified by public policy, and assisted by both public and private development, to intensify as a business center by accommodating the bulk of office and institutional growth destined for Queens. Three major office structures underway or in planning stage are expected to provide nearly one million square feet of space and 3,500 white collar jobs by 1975. Partly contained within a ten acre office district, to be fully assembled and leased by the City for private developers, this construction will be supplemented by an additional two and one-half million square feet of office space proposed for development between 1975 and 1985. Over 15,000 office jobs are expected to be accommodated in these structures by 1985. In addition, the construction at York College has commenced and by 1975 over one million square feet of classroom space should be completed, housing 5,000 students and over five hundred faculty and staff members. Beyond 1975, tentative plans for expansion place enrollment from 6,000 to 10,000 students. Other institutional facilities, such as a new Civil Court and University Medical Center, have either been approved or are under consideration for Jamaica Center.

Industrial Districts in New York City. The focus of public industrial development policies in the City of New York has been twofold: first, to renew and reconstitute those areas in present usage which have adequate rail, highway, transit and shipping facilities but retain undeveloped parcels, non-conforming uses, or industrial space vacated by firm losses; secondly, to develop large assembled tracts of vacant land on the periphery of the City through public provision of site improvements and public or private construction of industrial facilities. Some specific examples of implementation follow, listed by borough.

1. Bronx. The Southwest Bronx Industrial District which borders the Harlem and East Rivers from the 149th Street Bridge to Port Morris has been scheduled for redevelopment on a selected site basis as parcels with abandoned loft and residential buildings are gradually assembled in this old industrial area. Under consideration now are sites which would provide industrial space for several thousand new jobs. Development of the adjacent Hunts Point peninsula, into the New York City Food Processing and Distribution Center, best exemplifies the City's industrial park approach. At present, the Terminal Produce Market which accommodates over one hundred wholesalers formerly located in Lower Manhattan occupies roughly

one-third of the site. Additional markets for meat, fish and produce, as well as facilities for food distributors and processors, are now under development. The Center will eventually house the bulk of food processing and distribution employment in the City.

2. Brooklyn. Redevelopment of the Williamsburg-Greenpoint area will occur gradually over time as land is reallocated under renewal plans and mixed uses are separated, with blue collar activity encouraged to consolidate along Newtown Creek and the East River while housing is constructed further inland. The Greenpoint industrial renewal plan, which represents the short range implementation of development proposals for the area, is expected to provide 7,500 new jobs upon completion. Rehabilitation of the adjacent Brooklyn Navy Yard, which the City purchased from the Federal government, is analogous to plans for peripheral industrial parks. However, in this instance, five million square feet of industrial space and supporting infrastructure were acquired; redevelopment by 1980 is expected to accommodate a target of 15,000 new jobs. New industrial development is proceeding along the Jamaica Bay area of Brooklyn, from Brooklyn Marine Park eastward; a large complex which will ultimately house some 8,000 new industrial jobs is underway on a tract of vacant land in Flatlands, while an industrial park which would accommodate some 12,000 to 14,000 jobs is under consideration for the Spring Creek area.

3. Queens. Several new industrial parks are scheduled for outlying portions of Queens. In line with development along Jamaica Bay, a small site adjacent to Kennedy Airport has been designated for an air freight distribution center; and in the College Point area, a 500 acre industrial tract suitable for merchandise handling is now in the first phase of execution. The City has also identified other large and even less accessible tracts of undeveloped land for industrial growth--notably two parcels totaling one thousand acres in Staten Island. Given the steady outward progression of manufacturing from the core areas of the Region in New York and New Jersey, as well as the prospect for no growth in the SCA at large, it is doubtful that these larger land holdings could ever fruitfully be developed for industrial location. Even though industrial projects currently in execution may provide 25,000 new jobs, and the Planning Department (Planning for Jobs, 1971) recommends accelerating the program to accommodate 100,000 jobs by 1980, or roughly half of the expected industrial move-outs, the decline in factory-site employment in New York

City is nonetheless inevitable, even given the success of these measures.

Suburban Office and Industrial Locations. The stimulus for increasing employment densities in the Region outside New York City rests largely with the growth of office and institutional facilities which benefit from concentration. Although substantial increases in office work can justifiably be projected for sub-centers, recent experience has shown that incentives or assistance--usually in the form of urban renewal--has been necessary to attract office growth to smaller suburban downtowns. Scale, of course, is an attractive force of its own; in the suburban SCA, its influence is best manifested by the continued growth of office activity in downtown Newark. Table 21 presents attainable increases in office building employment for selected sub-centers in the suburban area. As projections, they are included for purposes of illustrating one aspect of the suburban development pattern; as likely centers, competing for limited white collar skills, they are not to be construed as target areas for future transportation assistance to the low-income residents of New York City.

Identifiable concentrations of factory-site employment growth in the suburban portion of the SCA are limited for several reasons. Although it is known that firms will increasingly prefer to locate in peripheral counties, such as Middlesex, Suffolk, and western Bergen, the tracts of land zoned for industry there exceed by far likely future requirements. Then, again, industrial densities, particularly those of newly located establishments, are exceedingly low, permitting concentration only across large areas; and erratic site selection may be encouraged by local inducements, such as favorable tax rates or site improvement subsidies. Nonetheless, certain areas appear

Table 21.
Potential Office Building Employment Growth for Selected Sub-Centers in the Suburban SCA, 1967-1985.

Sub-Center	Potential Increase
Newark	20,000
White Plains	20,000
Central Nassau	11,000
Central Bergen	10,500
Morristown	10,000
New Brunswick	7,500
Paterson	7,500
Jersey City	7,000
Elizabeth	3,500

Note: Rounded to the nearest five-hundredth. Based in part on recent past construction trends by sub-center and projected employment increases by county.
Source: Regional Plan Association.

ripe for development because they provide strategic locations adjacent to interstate transportation networks or regional transfer points. In the three growing counties, they are as follows: nearly half of Bergen County's expected increase, or 10,000 industrial jobs, can be accommodated in the Mahwah-Ramsey-Franklin Lakes area which is traversed by the proposed I-287 and the Erie Main Line; half of Middlesex County's growth of 28,000 jobs can similarly be accommodated in the northern Edison-Metuchen area which provides access to the New Jersey Turnpike, the Penn-Central rail line and the southern extension of I-287; the bulk of Suffolk's increase should be accommodated in the central corridor of the county.

A note on terms and methodology

1. **Total Employment by Industry.** Past trends and projections of total employment are an estimate of all jobs, including part-time and multiple jobs, summarized by industry (major divisions and 2-digit, as classified by the Standard Industrial Code [SIC]), by county of location for mid-March of the year indicated. The estimate of past trends was based primarily on U.S. Department of Commerce, County Business Patterns with excluded employment categories, such as the self-employed, farm workers, private household and unpaid family workers, railroad and government employees, estimated separately from a variety of sources. Supporting data were also provided by U.S. Department of Commerce, Census of Manufactures and Census of Business. The projection of future trends conforms largely to the Regional Plan Association forecasts contained in The Region's Growth (1967) and The Office Industry (1972). See appendix of The Region's Growth for methodology.

2. **Factory-Site Employment.** An estimate of manufacturing industry employment, excluding central administrative and auxiliary employment and other manufacturing employment located in office buildings, derived from past trends and projections of the manufacturing industry on a 2-digit basis by county for mid-March of the year indicated.

3. **Office Building Employment.** An estimate of jobs located in detached office buildings by county, derived from detailed industry past trends and projections, a conversion of the industry series to occupational trends (see 5 below), and an inventory of office floorspace. The projection of future trends conforms to those contained in The Office Industry.

4. **Other Employment.** An estimate of the remaining employment which consists of residence-related activity and goods handling operations that occurs outside of factory-sites and office buildings; derived from the industry employment series by county for mid-March of the year indicated.

5. **Total Employment by Occupation.** Past trends and projections of detailed industry employment converted to occupational detail (U.S. Bureau of the Census definition which differs somewhat from the U.S. Bureau of Labor Statistics definition) by means of a locally adjusted (Region and counties) industry occupation matrix. The Region-wide estimates conform to the forecasts contained in The Region's Growth; the construction was largely based on U.S. Bureau of the Census and National Planning Association data, though industry occupation coefficients from the U.S. Bureau of Labor Statistics and Tri-State Regional Planning Commission were also used, after reconciliation.

6. **White Collar Employment.** An estimate of total industry employment in the four major categories of white collar skill: professional, technical; managerial; clerical; and sales, based on the U.S. Bureau of the Census occupational definition.

7. **Blue Collar Employment.** An estimate of total industry employment in the three major categories of blue collar skill: craftsmen, foremen (skilled); operatives (semi-skilled); and laborers (unskilled), based on the U.S. Bureau of the Census occupational definition, (see 5 above for overall derivation). Note that blue collar employment is not analogous to factory-site employment in that all major industries require some blue collar skills and contribute, to some degree, to the profile of blue collar demand.

8. **Service Employment.** An estimate of total industry employment in the two major categories of service skill: private household, and other service, based on the U.S. Bureau of the Census occupational definition.

9. **Labor Force by Occupation.** Past trends and projections of the labor force by occupation are an estimate of the skills of all participants in the labor force, including the unemployed, constructed on a detailed stratification of the population by age, sex, and ethnic/racial characteristics by county of residence. The 1960 profile was based on the U.S. Bureau of the Census, Census of Population. The current estimate and forecasts were based on an estimate and projection of population growth and redistribution (using natural increase and migration factors), changes in labor force

participation, and upgrading in the profile of skill attainment, by detailed age, sex, and ethnic/racial characteristics. The construction of current estimates relied heavily on indicators of recent racial/ethnic change; for overall population--the special censuses and other Census Bureau surveys, vital statistics and enrollment data, private surveys and other sources;

for labor force participation rates and occupational attainment--U.S. Bureau of Labor Statistics Urban Employment Surveys, U.S. Bureau of the Census Current Population Reports, and other sources such as Rutgers University, Newark. The forecasts assumed projected changes in line with past rates of change, 1950 to 1968.

Table 22.
Estimated Skill Composition of Covered Employment by Small Area in the New York-N.E. New Jersey SCA, 1969.

(Jobs in Thousands)

Key ^a	Small Area Location	Blue Collar				Clerical and Sales	Reported Total ^b	Key ^a	Small Area Location	Blue Collar				Clerical and Sales	Reported Total ^b
		Semi and Unskilled	Skilled	Service						Semi and Unskilled	Skilled	Service			
1	Downtown	40.7	23.4	19.9	176.2	374.8	32	South Bronx	28.2	9.7	4.2	21.0	76.7		
2	Lower East Side	27.8	15.8	11.1	44.9	126.4	33	Tremont-							
3	Greenwich Village-							University Heights	5.5	2.2	1.4	4.4	16.8		
4	Madison Square-						34	Fordham-							
	Garment District	138.3	38.7	33.4	151.0	454.8		Riverdale	5.1	2.1	2.5	6.1	19.8		
5	Midtown East	46.2	34.0	36.2	120.0	341.1	35	Morris Park-							
6	Midtown West	35.3	24.2	35.1	81.4	246.5		Soundview	7.8	4.9	2.6	8.3	29.4		
7	Upper West Side	9.4	4.3	7.9	16.8	50.8	36	Baychester-							
8	Upper East Side	10.7	6.9	16.4	18.2	67.5		Williamsbridge	8.0	4.2	2.3	5.1	24.4		
9	Harlem	11.0	4.7	4.3	12.4	41.7	37	East Bronx	1.3	.5	.5	1.6	5.0		
10	Washington Heights	7.5	3.3	3.9	10.4	32.7		Bronx Total	55.9	23.6	13.5	46.5	172.1		
	Manhattan Total	390.2	181.8	180.0	695.5	1,939.3	38	St. George	3.3	1.5	1.3	3.2	11.9		
11	Downtown Brooklyn	34.8	12.5	5.8	22.4	92.8	39	New Dorp	1.7	1.1	.8	2.1	7.4		
12	Bedford Stuyvesant-						40	West Shore	1.7	1.1	.3	1.5	5.9		
	Brownsville	13.9	5.1	3.3	10.9	41.8	41	Tottenville	.8	.4	.2	.7	2.6		
13	Bushwick	24.6	6.8	2.3	15.0	58.1		Richmond Total	7.5	4.1	2.6	7.5	27.8		
14	Williamsburg-						42	Nassau	77.2	50.9	34.1	98.3	344.4		
	Greenpoint	20.0	6.3	1.5	8.5	43.7	43	Rockland	10.3	5.9	3.3	9.5	38.3		
15	Bush Terminal-						44	Suffolk	40.8	23.3	14.6	45.6	161.5		
	Greenwood	15.9	4.6	1.8	7.3	35.8	45	Westchester	57.5	32.9	21.5	63.2	226.1		
16	Flatbush	11.8	4.3	4.2	10.3	38.2	46	Bergen	72.7	35.9	15.9	68.6	248.5		
17	East New York	12.2	4.1	1.5	6.0	29.0	47	Essex	84.8	46.5	21.1	104.0	328.5		
18	Bay Ridge	3.9	.9	1.6	4.6	13.6	48	Hudson	84.0	28.5	9.5	49.1	209.1		
19	Bensonhurst	6.3	4.6	1.5	8.0	23.8	49	Middlesex	52.6	24.5	8.8	37.6	156.8		
20	Coney Island-						50	Morris	42.7	22.5	13.7	56.3	172.5		
	Gravesend	7.7	2.4	4.1	6.9	26.3	51	Passaic	54.6	22.2	7.7	36.9	150.8		
21	Canarsie-Flatlands	8.1	2.9	1.8	4.8	21.9	52	Somerset	14.0	7.4	2.8	12.4	47.5		
	Brooklyn Total	162.8	55.5	29.9	106.6	433.4	53	Union	62.4	33.1	11.6	56.0	209.8		
22	Long Island City	36.4	17.0	6.4	27.7	106.0		SCA Total	1,375.1	656.1	428.1	1,596.8	5,249.0		
23	Woodside-Maspeth	11.6	4.9	2.1	9.1	34.8									
24	Jackson Heights-														
	Corona	11.1	9.3	7.9	16.1	57.2									
25	Ridgewood-														
	Middle Village	6.9	1.6	.9	3.6	15.6									
26	Ozone Park	9.4	4.0	3.6	7.1	30.5									
27	Flushing-														
	College Point	11.5	9.6	4.6	13.0	49.7									
28	Jamaica	6.4	4.1	4.2	12.2	37.3									
29	St. Albans	5.3	2.1	2.6	4.6	18.1									
30	Little Neck	4.6	2.3	2.1	6.3	19.8									
31	Kennedy Airport-														
	The Rockaways	3.3	3.4	3.7	5.5	20.2									
	Queens Total	105.1	57.5	37.5	103.2	362.6									

^aKeyed to areas defined on Map 19, representing aggregates of postal zones.

^bBased on employment covered by Unemployment Insurance, as reported to the New York and New Jersey Departments of Labor on an industry basis.

^cDetails do not add to totals because of the inclusion of a Brooklyn and Nassau postal zone in two Queens small areas.

Note: Because of the limited coverage of reported employment, which represents approximately 75 percent of total employment in the SCA, these small area estimates do not account for the universe of jobs in each area. For blue collar employment, however, the coverage is much more comprehensive, partly because of the extensive coverage of manufacturing workers by Unemployment Insurance; estimated blue collar employment in reported employment represents over 90 percent of total blue collar jobs in the SCA. Service jobs, by contrast, represent 50 percent of total service employment, and white collar jobs, including those in professional and managerial occupations, account for 70 percent of total in the SCA. The estimates also reflect some errors in data reporting; namely, some firms report total employment from multi-establishment operations at a central location, which results in some geographic bias towards higher-density employment concentrations. Again, however, this misrepresentation appears to be of less significance in the blue collar sector. Source: Regional Plan Association.



Map 19.
Small Area Employment Zones for Table 22



CHAPTER 3. POVERTY IN THE CITY

The New York City population's lag behind the skill requirements of the Region's economy, documented in the previous chapter, is strongly reflected in its income. Ultimately, the goal of any programs to improve employment opportunities and make them more accessible is to increase the income of the area's residents, and to achieve a more equitable distribution of this income. This chapter then focuses on the dimensions of poverty in New York City, documenting the urgency of the needs. It further deals with some characteristics of the poor, suggesting approaches to solving the problem. Finally, it pinpoints the geographic location of the poor, with an eye to proposing transportation improvements.

The growth and distribution of income

In real terms, the per capita money income of residents in the New York SCA increased by two-thirds between 1949 and 1968, from \$2,150 to \$3,600 in constant (1968) dollars. At the same time, aggregate cash wealth climbed to over \$55 billion, reflecting, in part, population growth. Even though real per capita income grew at a faster rate in the nation over the

period, the SCA, with 8 percent of the nation's population, still retained roughly 10 percent of total national money income by period end.*

Other indicators illustrate that residents of the New York SCA are still wealthier, on average, than their counterparts in large metropolitan areas or the nation as a whole. In 1968, the estimated mean income of families and unrelated individuals in the SCA was \$9,800. This compared favorably with an average cash income of \$8,500 in the nation and \$9,600 in all SMSA's with over one million population. Even the average incomes of central city and suburban residents, taken separately, retained a favorable margin in the New York area over those in all large metropolitan areas. In 1968, the mean income of families and unrelated individuals was \$8,530 in New York City (compared to \$8,250 in other central cities), and \$11,160 in the suburban SCA.

Nevertheless, several detrimental trends emerge if one compares the change in average and median incomes in the SCA, New York City, and the nation over the recent period.

As Table 23 shows, there has been a narrowing of the difference in average wealth between the SCA and

Table 23.
Mean and Median Money Income of Families and Unrelated Individuals in the New York SCA, New York City, and the Nation, 1949 to 1968.

	(in constant 1968 dollars)		
	1949	1959	1968
Mean Incomes			
United States	\$4,691	\$6,932	\$8,453
New York — N.E. N.J. SCA	6,672	8,543	9,788
New York City	6,156	7,526	8,532
Median Incomes			
United States	\$3,866	\$5,831	\$7,410
New York — N.E. N.J. SCA	4,760	7,020	8,000
New York City	4,490	6,220	6,670

Source: Regional Plan Association, based on the U.S. Census 1950 and 1960 and the Current Population Survey, 1969.

* Money (cash) income is a U.S. Census and Current Population Survey income concept which is based on cash earnings of families and unrelated individuals from wages, salaries, self-employment, rentals, interest, pensions and other monetary sources before taxes. It does not contain "in-kind" or non-monetary income which is included in the personal income concept. Nor is aggregate money income of families and unrelated individuals (1 person families) equivalent to household income.

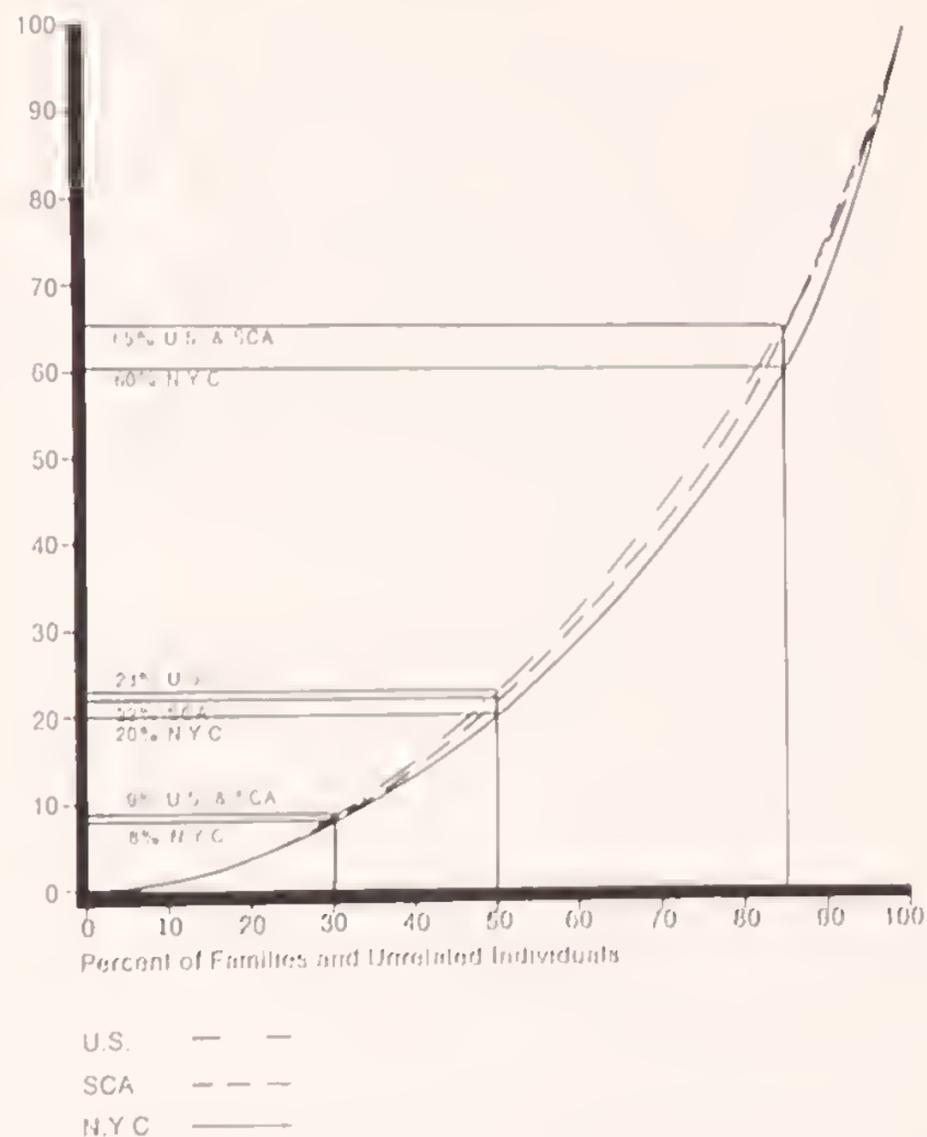
the nation, and a convergence between New York City and the nation. In 1949, the City's mean income stood a full 31 percent above the nation as a whole, but by 1968, it was only 1 percent higher. With continuing urbanization, it is to be expected that the average money income of families and unrelated individuals will reflect a rapid rate of increase, bringing mean values for the nation as a whole closer to those of its urban areas. But the disproportionately slow growth in central city income, compared to the metropolitan area, is a true economic setback brought about by the increasing segregation of poverty within the older urbanized areas. However, while the average income of New York City residents still remains slightly above the national average, in the central cities of all large SMSA's, it falls below the norm.

A further examination of data in Table 23 suggests that while families and unrelated individuals of the New York area are wealthier, on average, the share of those impoverished is not substantially different. Mean and median values consistently appear closest in the income profile of the nation and most divergent in that of New York City, indicating that while neither profile represents a symmetrical distribution of income, the City's is more skewed--allocating a greater share of wealth to upper-income groups--than the nation or the SCA as a whole. The unequal distribution of income indicated by these relationships can be graphically illustrated by a curve which plots the cumulative frequency distributions of income recipients by aggregate income held for New York City, the New York SCA, and the nation.

Although Chart 3 portrays curves which are relatively similar in shape, those for the New York SCA and New York City are successively more distant from the "diagonal" (a hypothetical line depicting an equal distribution of income). It indicates that the lower half of the families and unrelated individuals hold a smaller share of aggregate money income in the City, than in the nation (20 percent in contrast with 23 percent), while in the SCA the lower half remains disadvantaged with respect to the nation, but the portion of income held by it (21.5 percent of total) more nearly conforms to the national average. Among the upper-income group in the nation and the City, the holdings of the top 15 percent of families and unrelated individuals show even less conformity in the share of aggregate wealth which they represent. In the nation, the top 15 percent control 35 percent of total money income; in New York City their share represents a full 40 percent, or twice the amount of in-

Chart 3
The Distribution of Money Income in New York City, the N.Y.—N.E. N.J. SCA and the Nation, 1968.

Percent of
Aggregate
Money Income in
1968 Dollars



come accruing to the lower 50 percent of families and unrelated individuals. Once again, the SCA more closely emulates the nation, though a larger portion of wealth (38 percent of total) is held by the top 15 percent.

Table 24 presents total families and unrelated individuals by income class interval in 1968 for the nation, the New York SCA, and New York City. Summarizing the conditions depicted by Chart 3, the table indicates that the percent of total recipients in the lower-income class increases substantially in New York City relative to the nation and the SCA, while average money income of this group shows little variation between the areas. Offsetting this is a relatively smaller middle class in New York with average incomes roughly comparable to the nation, but a proportional upper-income group whose annual receipts are more than 20 percent greater than the average in the nation.

In the recent past, income distributions expressed in constant dollars have undergone a remarkable change, one which is suggested, of course, by the overall growth of mean values discussed earlier. But aside from real increases in average income, shifts within the distributions have taken place. Median income has gradually represented an increasing share of average income in the nation, reflecting a transfer in the share of cash holdings from recipients above the income midpoint to those below. But in New York City, where median income falls heavily behind mean income, the correction over time has merely kept pace, in percentage points, with the convergence that has taken place in the nation. As a result, the skewness apparent in most recent data for New York City has retained its shape relative to the nation over the past two decades. And combined with a slower growth in average income, relative to the nation, the median income of families and unrelated individuals in New York City slipped behind the nation for the first time by 1968.

In the New York SCA, however, and particularly in its suburban portion, a more favorable redistribution of income has accompanied the rapid growth in real wealth. That the benefit of this Region-wide improvement (occurring at twice the national rate) was not reflected in New York City testifies to the geographic barriers that concentrate lower-income people in central cities, while middle-income families become an increasing share of suburban households. Charts 4 and 5 depict the change in income distribu-

Table 24.
The Distribution of Income Recipients and Aggregate Money Income by Income Class Interval in the New York SCA, New York City and the Nation, 1968.

Income Class	Percent of Fam. & Unrel. Individ.	Percent of Agg. Money Income	Mean Class Income
Under \$5,000			
United States	32.9%	10.1%	\$2,588
New York — N.E. N.J. SCA	29.9	8.0	2,628
New York City	37.5	11.5	2,622
\$5,000 — \$10,000			
United States	34.5%	30.5%	\$7,456
New York — N.E. N.J. SCA	32.2	24.5	7,453
New York City	33.1	28.4	7,315
\$10,000 — \$15,000			
United States	20.7%	29.4%	\$12,016
New York — N.E. N.J. SCA	22.2	27.8	12,223
New York City	18.0	25.7	12,165
\$15,000 and Over			
United States	11.9%	30.0%	\$21,263
New York — N.E. N.J. SCA	15.7	39.7	24,777
New York City	11.4	34.4	25,850

Source: Regional Plan Association, based on the Current Population Survey, 1969

tions of New York City and the suburban SCA over the period 1949 to 1968. As is apparent in a comparison of the Charts, the lower half of income recipients in the suburbs (those under \$8,000 in 1968) increased their share of aggregate money income from 19.5 to 24.5 percent over the past two decades, while those in New York City (below a median income of \$6,670 in 1968) merely captured 1 percentage point more, to 20 percent of total wealth. Indeed, the transfer of income within the City over the period underwent a setback between 1959 and 1968, as is evident in the reversal of the curves in Chart 4. * Table 25 summarizes the changing proportions of lower-income residents in the New York SCA, New York City and the nation. **

As Table 25 shows, the portion of lower-income recipients has declined most rapidly in the nation, slightly less so in the suburban SCA, and least of all in New York City. By 1968, families and unrelated individuals with annual incomes under \$5,000 represented a larger share of total in New York City than in the nation, while the suburban share was substantially be-

* The Current Population Survey of 1969 is generally credited with producing a more comprehensive profile of money income than is the decennial census, because of personal interviewing techniques. The relationship between 1959 and 1968 data may, therefore, be somewhat understated. Other indicators show, however, that the growth in real wealth was appreciably greater in the period 1949 to 1959, than 1959 to 1968.

** Expressed in current dollars, the lower-income cutoff of \$5,000 in 1968 was \$3,350 in 1949 and \$4,100 in 1959.

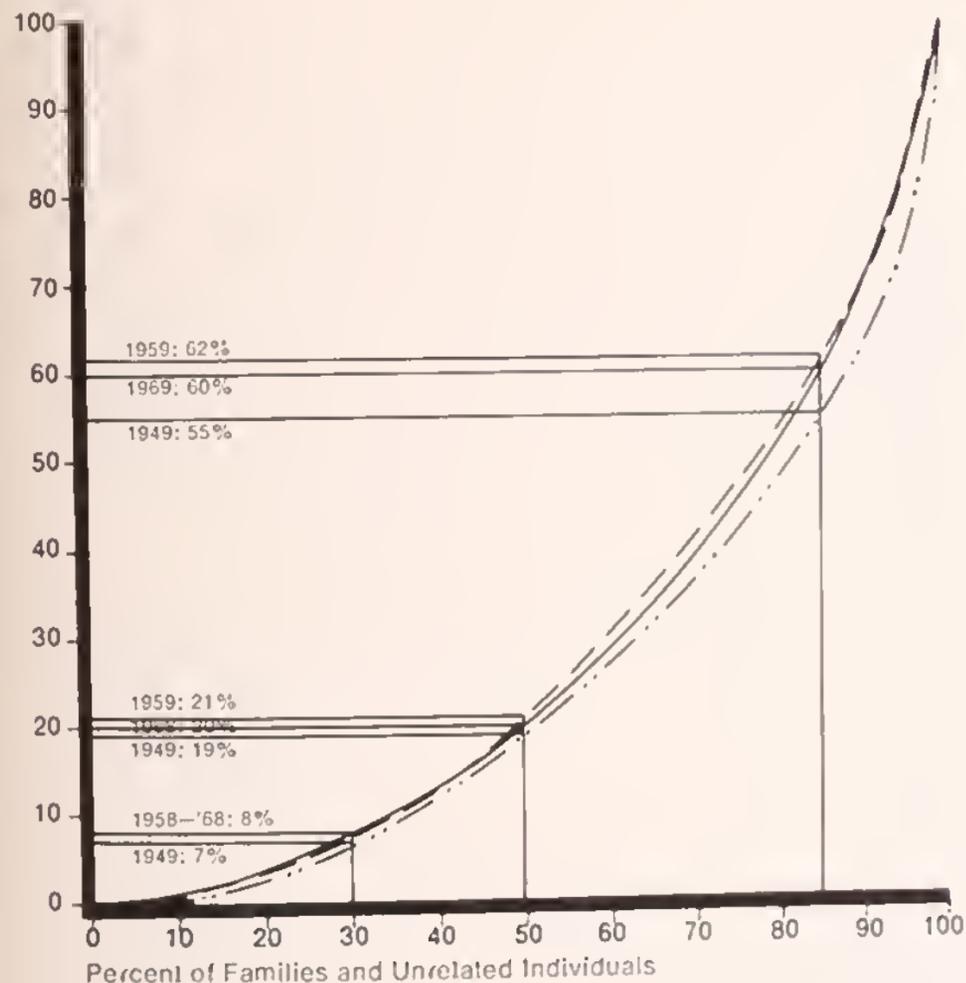
Table 25.
Families and Unrelated Individuals with Money Incomes under \$5,000 in the New York SCA, New York City and the Nation, 1949 to 1968.

Lower-Income Recipients as a Percent of Total In:	(in constant 1968 dollars)		
	1949	1959	1968
United States	60.4%	44.1%	32.9%
New York — N.E. N.J. SCA	53.4	33.0	29.9
New York City	57.1	38.9	37.5
Suburban SCA	46.9	25.3	21.6
Lower-Income Recipients as a Percent of Nation in:			
New York — N.E. N.J. SCA	7.6%	6.8%	6.4%
New York City	5.2	4.6	5.5
Suburban SCA	2.4	2.2	2.9

Source: Regional Plan Association, based on the U.S. Census, 1950 and 1960 and the Current Population Survey, 1969.

Chart 4
Changes in the Distribution of Money Income in New York City, 1949 to 1968.

Percent of
Aggregate
Money Income in
1968 Dollars



1949 — · — · —
1959 — - - -
1968 — — —

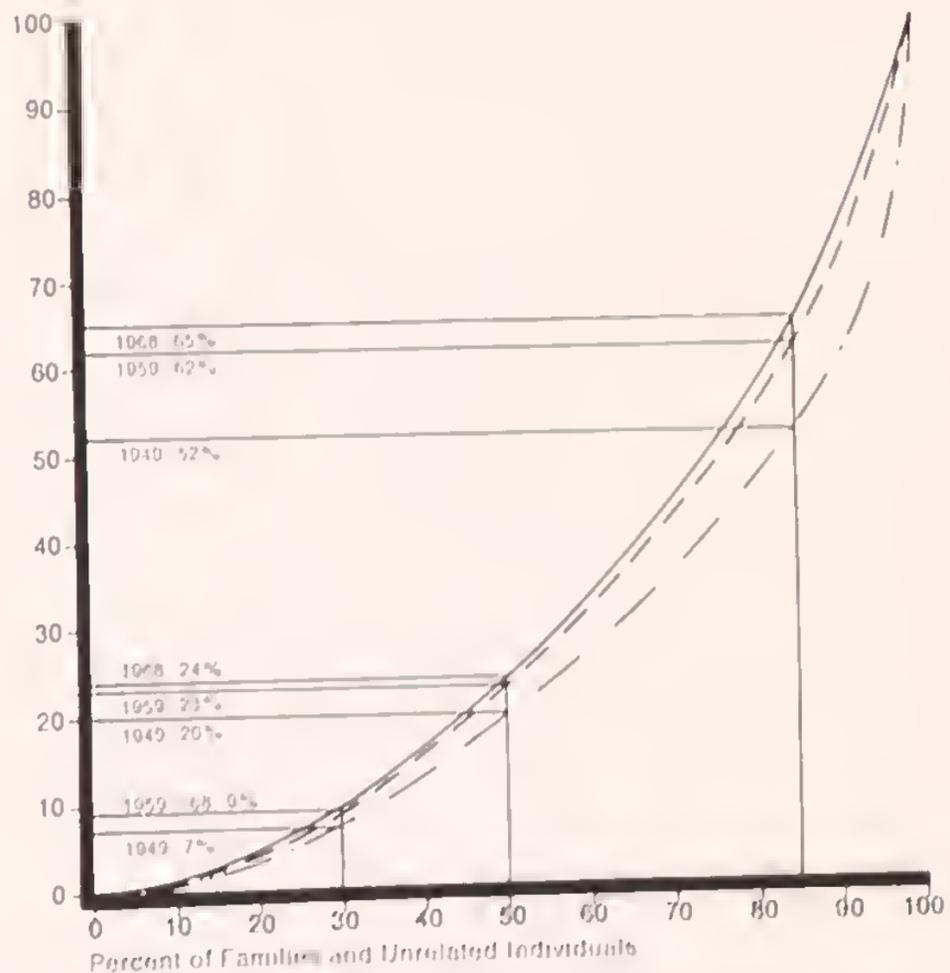
low the national average. Although the absolute number of lower-income units has declined by roughly 350,000 in the City over the two decades, to 1.2 million families and unrelated individuals by 1968, they have risen as a percent of the nation's total, and most dramatically so over the past decade. The rise in the suburbs, however, has merely reflected the increasing portion of all families and unrelated individuals which the suburban SCA represents in the nation (3.1 to 4.4 percent, 1949 to 1968).

The dimensions of poverty

Although an annual income of \$5,000 represents a reasonable determination of a lower-income standard of living, it does not define impoverishment. Clearly, family size is a critical factor: unrelated individuals,

Chart 5
Changes in the Distribution of Money Income in 12 Suburban Counties of the N.Y.—N.E. N.J. SCA, 1949 to 1968.

Percent of
Aggregate
Money Income in
1968 Dollars



1949 — · — · —
1959 — - - -
1968 — — —

or one person families, can more than adequately subsist at this level, while families composed of six or more persons require appreciably larger incomes. Then again, the cost of living differs by area, although the degree of variation between the nation and the Region is less than might be anticipated. In general, the definition of poverty is one of the most elusive in social science literature. Poverty measures are interpreted differently by state, local and federal agencies--some consider family size, sex of family head, age of family members, cost of living, taxes and wage rates while others do not; some have built-in sliding schedules based on cost of living and others require legislative action to revise.

Perhaps the most basic definition, that of the Social Security Administration and the Census Bureau, measures poverty in terms of a nutritionally adequate diet. A family is poor if the cost of maintaining this diet per person is more than one-third the annual in-

come. Sex of family head and urban or rural location is also taken into consideration. Table 26 provides the Census Bureau's poverty income thresholds in 1968, adjusted for cost of living differences in the New York SCA. For comparison, the Table also contains the Bureau of Labor Statistics' lower level-of-living budget for the SCA in 1968.

Table 26.
Federal Poverty and Lower-Income Budget Thresholds for the New York SCA, 1968.

Family Size	Census Bureau	BLS
1 Person	\$1,750	\$2,435
2 Persons	2,264	3,845
3 Persons	2,777	5,319
4 Persons	3,556	6,409
5 Persons	4,192	7,370
6 Persons or more	5,186	8,332

Source: U.S. Bureau of Census and U.S. Bureau of Labor Statistics

Applying both standards to the 1968 income distribution of families and unrelated individuals, by family size, * permits us to dimension the poor and near-poor population of New York City. Table 27 provides these estimates while Chart 6 portrays the target population as a share of total in the City. An alternative means of defining the poverty population--based on the public assistance standards of the Human Resources Administration of New York City--produces an estimate comparable to that derived from Census Bureau standards, although the income thresholds by family size differ somewhat. **

As Table 27 shows, by official federal poverty definition, some half-million poor families and unrelated individuals resided in New York City in 1968. As a share of the City's total, they represented 16 percent, but as a share of the nation's impoverished, 5.1 percent (in contrast to 4.8 percent of all families and un-

related individuals). More than half of the City's poverty group were one person families, who comprised over a quarter of the unrelated individuals residing in New York. Chart 6 indicates that the poor were less numerous among two and three person families, but rose again among larger families to a high of 18.5 percent of six or more person families. As a result, nearly half of all poor persons are in families of four or more. The total population of poor families and unrelated individuals in New York City in 1968 was slightly in excess of one million (1,062,000), a figure which compares closely to the City's welfare easeload of 980,000 persons by the end of 1968.

Although one in every eight residents of New York City is officially considered poor, many more live on the borderline of poverty or, by alternative criteria, would equally be defined as impoverished. Critics of the federal poverty standards point out that "... using the cost of housing, rather than the cost of food, to define poverty (results) in much higher income thresholds than those set forth...".* Moreover, federal estimates of the income required to maintain a lower level-of-living (BLS) are nearly twice as large as the poverty cutoff for an average size family. The problem rests, in part, with the conception of household necessities; federal poverty guidelines maintain a fixed bundle of consumer goods, annually adjusted for price changes, but society's notion of a minimum standard of living increases over time, as some items (such as automobiles) lose their luxury status. Table 27, therefore, provides an estimate of New York City's population with incomes below the lower-income budget required for residents of the area in 1968. Those with incomes above the poverty level but below this minimum standard of living are defined, for purposes of this study, as the near-poor.

The near-poor in New York City numbered 1.4 million (1,389,400) in 1968; combined with those below the poverty level, the population of the City with annual incomes less than a lower level-of-living budget is estimated to be nearly 2.5 million (2,451,300) or 31 percent of the total population. Those who are nearly impoverished differ from the poor in several respects. Though the number of near-poor families and unrelated individuals is less, the number of persons affected is

* Details of 1969 Current Population Survey with annual money incomes reported for 1968.

** See Blanche Bernstein, "Welfare in New York City," *City Almanac*, Vol. 4, No. 5, 1970 (The Center for New York City Affairs of the New School for Social Research). Using annual welfare allowances, including average rent, by size of family, Dr. Bernstein derived a population of 1,043,000 persons with incomes below the welfare standard in New York City in 1968.

* Real Estate Research Corporation, unpublished report to the Department of Housing and Urban Development, 1968.

Chart 6
The Poor and Near-Poor Population of New York City in 1968.

Families and
 Unrelated
 Individuals
 in Thousands

Population in Poor
 and Near-Poor
 Families in
 Thousands

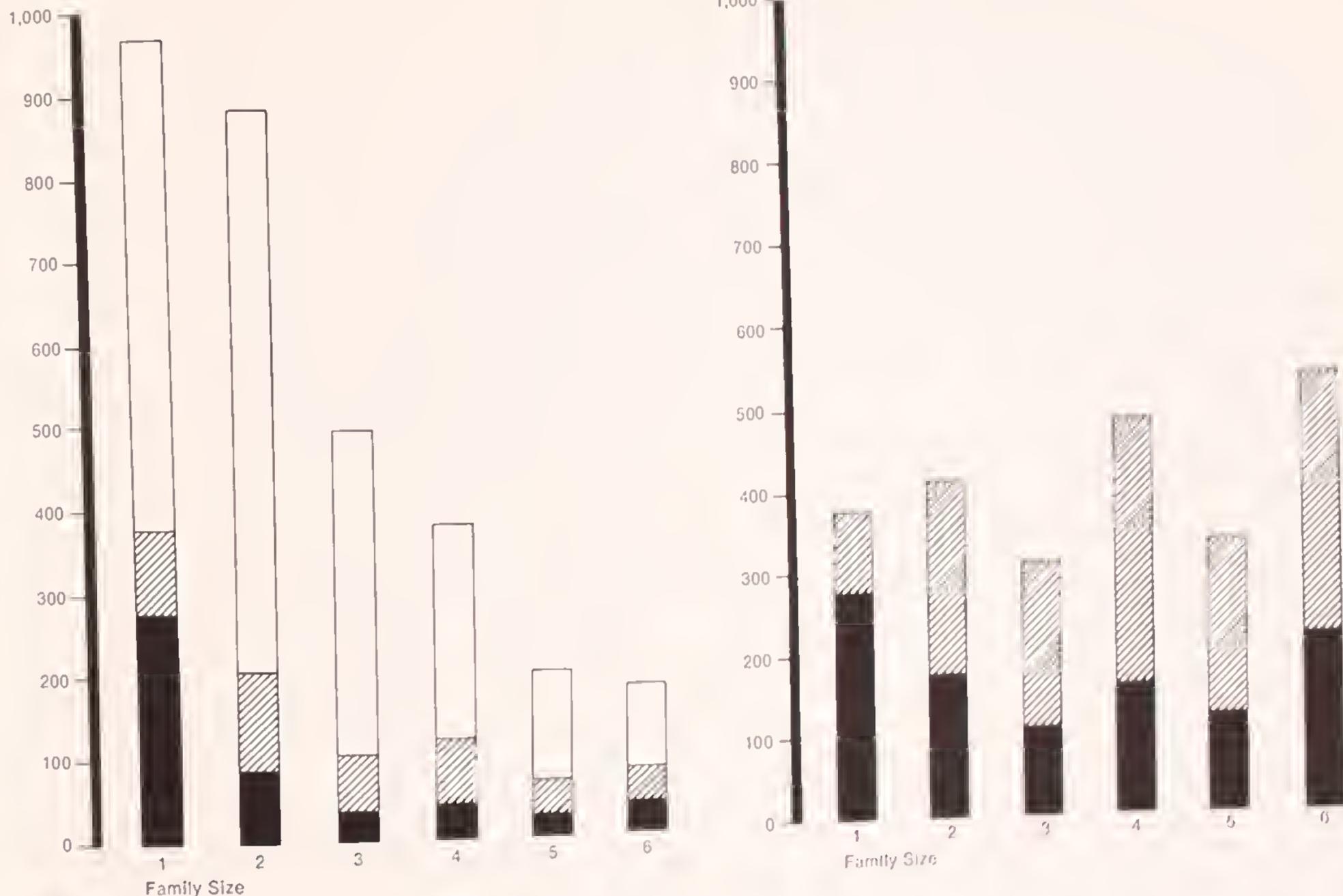


Table 27.
The Poverty and Near-Poor Population of New York City, 1968.

Size of Family ^a	Families (000's)			As a Percent of Total Families			Family Persons (000's) ^b		
	Poor ^b	Near-Poor ^c	Total ^d	Poor ^b	Near-Poor ^c	Total ^d	Poor ^b	Near-Poor ^c	Total ^d
1 Person	273.7	104.0	377.7	28.4%	10.8%	39.2%	273.7	104.0	377.7
2 Persons	85.7	118.8	204.5	9.8	13.6	23.4	171.3	237.7	409.0
3 Persons	36.9	66.0	102.9	7.5	13.4	20.9	110.7	167.9	308.6
4 Persons	41.0	79.0	120.0	10.8	20.8	31.6	164.1	315.9	480.0
5 Persons	24.1	43.1	67.2	12.1	21.6	33.7	120.6	215.4	336.0
6 Persons or more	32.6	46.8	79.4	18.5	26.6	45.1	221.5	318.5	540.0
Total	494.0	457.7	951.7	16.0	14.8	30.8	1,051.9	1,389.4	2,451.3

^a Consists of families and unrelated individuals (1 person families).

^b Upper limit defined by Census Bureau poverty thresholds in Table 25.

^c Upper limit defined by BLS lower-income budget thresholds and lower limit defined by Census Bureau poverty thresholds in Table 25.

^d Total poor and near-poor, or all those living under BLS lower-income budget thresholds.

Source: Regional Plan Association, based in part on the Current Population Survey, 1969.

substantially greater. Unrelated individuals comprise less than a quarter of the near-poor (in contrast to 55 percent of the poor), while well over half of the near-poor population (61 percent) is found in families of four or more. Indeed, the chances of maintaining a minimum standard of living (or above) are least of all for the largest family units: 45 percent of the City's population in six or more person families live on incomes less than a lower level budget.

Poverty and near-poverty also correlate with race. Table 28 provides a racial/ethnic distribution of New York City families by income class interval in 1968.* Unfortunately, the estimates are not further classified by family size; but the number of families in the lower-income class (under \$5,000) is only 10 percent greater than the total number with incomes below a lower level-of-living budget.

Table 28.
The Income Distribution of New York City Families by Racial/Ethnic Characteristic, 1968.

Income Class	White Families		Black & Puerto Rican Families	
	Total (000's)	Percent	Total (000's)	Percent
Under \$5,000	288.8	18.7%	350.2	57.5%
\$5,000 - \$10,000	756.9	49.0	216.7	35.6
\$10,000 - \$15,000	276.4	17.9	23.8	3.9
\$15,000 and Over	222.5	14.4	17.6	2.9
Total	1,546.0	100.0	608.7	100.0

Note: Details may not add to totals because of rounding.
Source: New York City Bureau of the Budget

As the table shows, the Black and Puerto Rican families of New York City are disproportionately concentrated in the lower interval where they comprised 55 percent of the City's families with incomes under \$5,000 in 1968. In the upper intervals, with over \$10,000 annual income, minorities represented only 8 percent of total, in sharp contrast to their share of all families in New York, which stood at 28 percent.

Characteristics of lower-income residents

To a considerable extent, the lower-income (poor and near-poor) population of New York City is comprised of non-working heads and dependents of per-

sons who are unemployed or not participating in the labor force. But at least to an equal extent, and probably greater, lower-income persons are associated with full-time earners or, comprised of families whose heads are employed persons with low earnings. In the nation, 48 percent of the family heads whose incomes fell below the official poverty level were employed in 1968; 49 percent were not in the labor force; and 3 percent were unemployed. Among unrelated individuals, a much smaller percent (32 percent) were earners in the nation. Although similar recent data were not available for the poor (as well as the near-poor) in New York City, several independent estimates and records suggest the employment characteristics associated with lower incomes.

In 1968, public assistance was extended to 890,000 persons (annual average) in New York City, roughly 525,000 of whom were children and the remaining 365,000, adults. The total number of family recipients on public assistance is comparable to the population of poor families (not counting unrelated individuals) defined in Table 27 (749,400 as compared with 788,200), while one-person cases on Home Relief and Adult Assistance represent roughly half of the poor unrelated individuals. Assuming a direct relationship between welfare and poverty populations, the officially defined poor of New York City were then comprised of roughly equal shares of children (550,000) and adults (500,000) in 1968. But half of the adult recipients of public assistance were heads of ADC (Aid to Dependent Children) families and more than a fifth received benefits for old age and disability, thus eliminating a goodly share from active participation in the labor force. Among the remaining 240,000 poor adults, 60 percent of whom were not on welfare, the potential for employment was considerably greater and, presumably, many were working. In comparison to the nation, however, it is probable that a lower share of all poor persons in New York City were earners in 1968 (19 percent of total in the nation).

Welfare characteristics cannot equally be applied to the near-poor; as Table 27 has shown, the near-poor have a somewhat different composition by family size, and their marginally greater incomes suggest a higher participation in the labor force. In characterizing both the poor and near-poor, the analysis of the New York City Cooperative Area Manpower Planning System (CAMPS), based on the New York State Department of Labor Annual Manpower Planning Report, is most useful. CAMPS has defined the work characteristics of the poor population of New York City for pur-

* Constructed by the New York City Bureau of the Budget, from Current Population Survey data and other sources. Note that the distribution does not contain estimates for unrelated individuals.

poses of assessing the demand for employment-related assistance through manpower programs of the fiscal year 1971. Neither the date nor the income standards adopted for this estimate compare with those of Table 27. Poverty thresholds were set at 133 percent of Census Bureau standards, which, expressed in relation to the previous estimate, yields a poverty population of 1,750,000 persons in New York City, midway between the poor and all those with lower incomes (poor and near-poor) in 1968. Even the worsening of economic conditions which accompanied the difference of several years is unlikely to have swelled the CAMPS poverty population to a size commensurate with that of the poor and near-poor in Table 27. Nonetheless, the dimension and composition of working-age poor, provided by CAMPS and shown in Table 29, is a closer approximation of the employment characteristics of lower-income residents in New York City than can be inferred from welfare or national poverty data.

Table 29.
CAMPS Target Population for Manpower Services, New York City, Fiscal Year 1971.

	Number
Poor, Employed Year-Round	444,200
Family Heads, Full-Time Employed	263,500
Unrelated Individuals, Full-Time Employed	128,700
Part-Time Employed and Second Wage Earners	52,000
Poor, with Some Unemployment During the Year	130,000
Youth (under 22)	40,000
Adults	75,000
Older Workers (45 and over)	15,000
Poor, Not in the Labor Force (Potentially Employable)	171,200
Welfare Recipients	100,000
Men — 25,000	
Women — 75,000	
Disabled, Handicapped	45,000
Parolees	12,000
Veterans (poor)	5,000
Addicts (rehabilitated)	6,000
Miscellaneous Others	3,200
Total	745,400

Source: New York City Cooperative Area Manpower Planning System (CAMPS). Plan for Fiscal Year 1970/1971.

Although year-round employment characterizes 60 percent of the poor adults in Table 29, CAMPS estimates indicate that roughly 250,000 additional adults (welfare recipients who head several hundred thousand families and unrelated individuals) are not in the labor force and are not potentially employable for reasons of child care, age and permanent disability. They are therefore excluded from the target population shown above. But including them in the profile of all poor families then suggests that roughly 54 percent of the

CAMPS poverty families have full-time employed heads, another 5 percent of the families have heads who incur some unemployment during the year, 18 percent have heads who are not in the labor force but are potentially employable (welfare recipients), and the remaining 33 percent of the families have heads who are also outside the labor force but have no employment potential at present (welfare recipients).

Among unrelated individuals, defined by CAMPS poverty standards, full-time employment is less frequent and non-participation in the labor force is much more prevalent. Roughly 38 percent of total are year-round earners, another 7 percent are unemployed, 24 percent are potentially employable non-participants, and 31 percent have no employment potential at present. The combined population of poor families and unrelated individuals in the CAMPS universe implies that just over half (51 percent) of all poor persons comprise family units (including one person families or unrelated individuals) with full-time employed heads.* Clearly, providing year-round employment for those potentially employable heads not in the labor force and for those with some unemployment during the year would reduce the welfare load somewhat and increase the share of population in poor families headed by a full-time worker, to perhaps three-fourths of total families. It is not likely, however, that providing jobs for the employable poor heads will lift many families above the poverty line, as long as the earnings potential, or skill characteristics, of the non-working heads does not differ considerably from those who are presently employed. Engaging more secondary earners may reduce the number of impoverished families, but increased provision of support services, such as day care centers, will be required. Therefore, unless

* CAMPS universe estimated by Regional Plan Association based on Current Population Survey data, reported income standards, and other information provided by the CAMPS report. It assumes that the average family size of employed heads is less than that of welfare families, but generally proportional to the poor population as a whole.

Accounting for differences between the CAMPS poverty standards and the lower-income guidelines adopted for Table 26 would imply that a somewhat greater margin of the City's population with incomes below the lower level-of-living budget comprise families with full-time employed heads.

the earnings potential of the full employed as well as the employable poor person is not further enhanced through skill achievement, the families they head or supplement with secondary earnings will continue to remain impoverished.

An example will suffice. At the New York State minimum wage of \$1.60 an hour in 1968, a person could earn \$3,300 a year with full-time employment. At the BLS minimum standard, this was not sufficient income for a family of two; at the Census Bureau standard, an average family of four would have been qualified as impoverished with this income. Meanwhile, the New York City welfare allowance (including average rent) for a family of four was roughly \$3,600 in that year; when minimum wages rose to \$1.85 in New York in 1971, for year-round earnings of \$3,800, the welfare allowance increased accordingly to \$4,200 for a family of four. Only a self-supporting single individual can adequately subsist (above the BLS lower level-of-living budget) earning minimum wages. For a two or three person family, minimum earnings from one worker would produce only a marginal incentive for employment (from \$300 to \$1,000 annually above the welfare allowance). For a family of four or more, there is clearly no incentive.

Contributors to poverty

One of the characteristics of poverty is that when a person is trapped in it, it is difficult to move up. Lack of education and skills as well as racial barriers are responsible for this. A 1969 study by John McCall, "An Analysis of Poverty," documents how much the probability of remaining in poverty is greater for nonwhites than for whites.

According to the Census Bureau, the number of families living in poverty areas in the Northeast United States declined dramatically between 1960 and 1967. However, "the number of white families dropped by about one-fourth while the number of nonwhite families did not change significantly." White families who had incomes under the poverty level and lived in poverty areas in 1960 were more mobile--both physically and economically. Their incomes rose or they were able to move out of poverty neighborhoods. Again, according to the Census Bureau:

As a result of these differential population changes, the percent of families residing

in poverty areas with incomes below the poverty level who were nonwhite increased from 40 to 51 percent between 1960 and 1967.*

Education. A recent publication of the Committee for Economic Development points out that as a group, Blacks do not enjoy the same educational advantages as do whites. Blacks have made gains at the secondary level however, and in 1969, the median years of school completed by whites and Blacks in the nation had closed to 12.7 and 12.3 respectively; in 1960, the figures were 12.4 years for whites and 11.4 for Blacks. In terms of higher education however, which is increasingly important to urban dwellers as low-skill, blue collar jobs continue to decrease in central cities, there is a sharp difference in the experience of Blacks and whites:

In 1960, the percentage of Blacks who had graduated from college almost equalled the white rate of twenty years earlier. The 1969 data gave rise to added pessimism; the percentage of Blacks who have graduated from college had risen from only 5 to 7 percent since 1960, while the white rate had risen from 14 to 19 percent.**

In describing the difference in the level of education offered the middle- and upper-income youth as opposed to low-income students, the Committee for Economic Development has said:

While the American schools have generally provided middle- and upper-income youth with the intellectual tools necessary for success in our society, they have commonly failed to cope effectively with the task of educating the disadvantaged youth in our urban centers... In the past there have always been large numbers of unskilled jobs

* Bureau of the Census. Population Characteristics: Educational Attainment, March, 1969. United States Department of Commerce, P-20, No. 194. February, 1970, p. 5

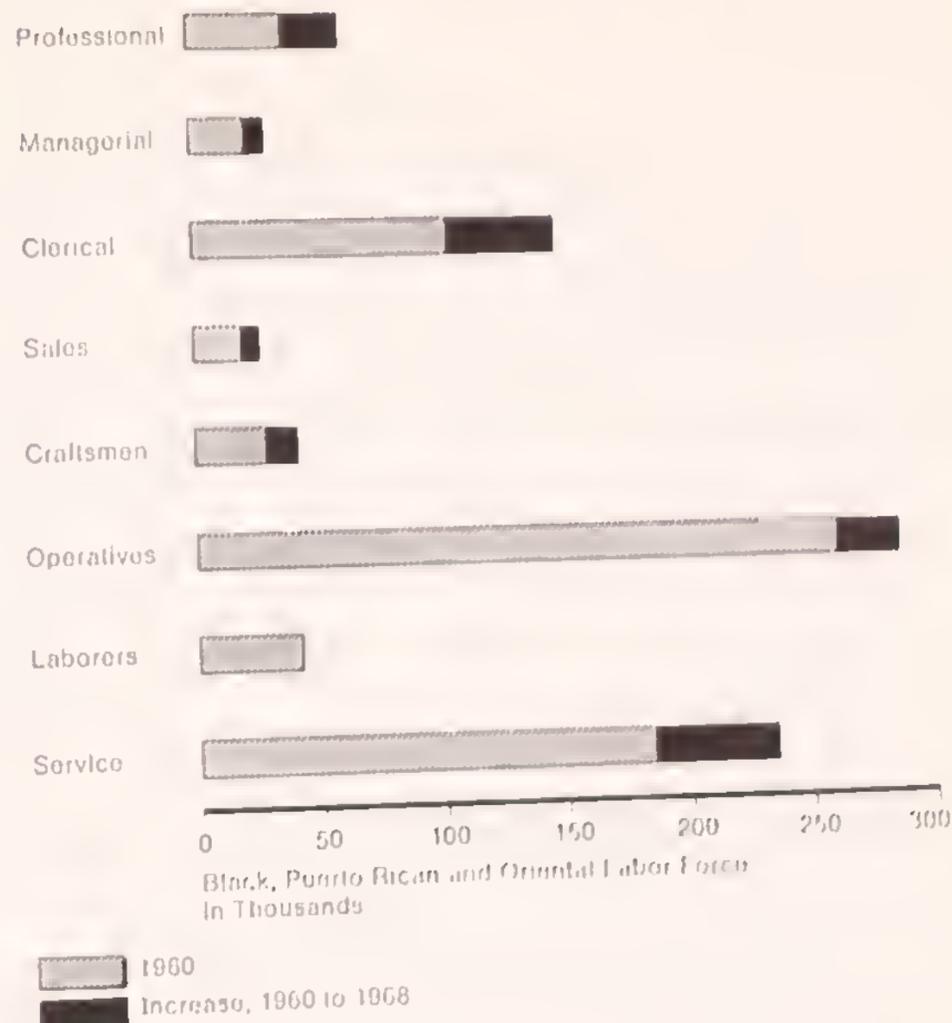
** Committee for Economic Development. Education for the Urban Disadvantaged: from Preschool to Employment. New York: March, 1971, p. 84

for the functionally illiterate. But as technology absorbs the tasks of unskilled workers, the chasm between the poor with inadequate schooling and the remainder of society is widening at a rapid rate. Even where unskilled jobs remain, they are frequently inaccessible to the poor of our central cities.*

According to the Bureau of Labor Statistics' Urban Employment Survey conducted in East Harlem, Central Harlem, South Bronx and Bedford-Stuyvesant, of those employed workers 18 years old and over, the median level of school completed by whites was 11.8; for Blacks, 11.1 years; and for Puerto Ricans only 9.2 years. In New York's poverty areas then, even the figure for whites is substantially below the national median in 1960 of 12.4 years of schooling. In 1966, from 18 to 36 percent of the residents of these major poverty areas had failed to go beyond eighth grade. In the City as a whole in 1960, over 9 percent of the white population had completed four years or more of college, while the same was true for only 4.2 percent of the nonwhite and less than 1 percent of all Puerto Rican residents. A recent survey of the graduating class in New York City public high schools indicated that well under half of a given matriculating class actually graduates--from 43 percent in the academic program to under 10 percent of those enrolled in commercial, technical and vocational studies. It is not surprising, considering the educational status of minority residents, who comprise well over half of the City's

* Ibid, p. 9

Chart 7
Increase in Minority Workers by Occupation in New York City,
1960-1968.



public school enrollment, to find these groups predominate in lower-skill, lower-paid jobs—and as a result, receive lower incomes.

Skill level. The skill characteristics of New York City's resident labor force in 1968 are summarized in Table 30, broken down by white, non Puerto Rican on one hand and minority—Black, Oriental, and Puerto Rican—on the other. It is evident that while almost 60 percent of the white resident workers are in white

Table 30.
Skill Characteristics of the Resident Labor Force in New York City, 1968.

Occupation	Nationwide Median Money Income \$	Total (000's)		As a % of Total		Minority Increase, 1960-68	
		White ^a	Minority ^b	White ^a	Minority ^b	Total (000)	% of Total
White Collar		1,511.1	316.2	59.9%	32.9%	+ 129.7	55.9%
Prof., Tech.	\$9,960	366.0	62.5	14.5	6.5	24.2	10.4
Managerial	9,760	231.0	32.3	9.1	3.4	9.3	4.0
Clerical	7,730	697.9	193.4	27.7	20.1	48.7	38.3
Sales	7,030	216.2	28.0	8.6	2.9	7.5	3.2
Blue Collar		782.7	411.3	31.0	42.7	52.3	22.0
Craftsmen	7,700	285.8	81.4	11.4	8.4	26.9	11.6
Operatives	6,203	415.2	286.9	16.4	29.8	25.7	11.1
Laborers	4,165	80.7	43.0	3.2	4.5	- 0.3	- 0.1
Service	4,820	229.1	235.1	9.1	24.4	50.0	21.5
Total		2,522.9	962.6	100.0	100.0	232.0	100.0

^a White non Puerto Rican

^b Black, Oriental, other nonwhite, and Puerto Rican

Source: Regional Plan Association, based in part on U.S. Bureau of Labor Statistics and other sources.

collar occupations, only about 33 percent of the minority workers hold these occupations. Predictably, almost one-quarter of the minority workers are in service occupations which are held by less than one-tenth of the whites. Blue collar jobs appear to be somewhat more balanced on the whole, but again, minority workers are disproportionately concentrated in the lower-skilled, operative positions, as opposed to the higher-skilled craftsmen. Though recent data characterizing these skill levels by earnings in the New York area are not available, nationwide figures are indicated in Table 30 to give a sense of the incomes involved. Significantly, however, the increase in minority workers among the occupations listed in Table 30, between 1960 and 1968, is close to the proportions listed for whites and substantiates the considerable degree of skill upgrading referred to earlier in Chapter 2. This is illustrated in Chart 7.

The distribution of earnings which results from this pattern of skill attainment is summarized from a continuously monitored sample by the Social Security Administration for New York City, in Table 31. It can be seen that in 1966, 72 percent of the male Black workers, and almost 89 percent of the female Black workers were earning less than \$5,000 annually, whereas for whites, the proportions were 39 and 75 percent, respectively. Although comparable data were not available for Puerto Rican workers, other sources suggest that they are even more economically disadvantaged than the Black work force. According to the BLS survey of urban employment in poverty areas of New York City, the median weekly earnings of all residents with full-time schedules in 1969 was as follows: \$111 for whites; \$95 for Blacks; and only \$87 for Puerto Ricans. The special problem of Puerto Rican workers emerges in examining their skill patterns, for in contrast to both white and Black workers, Puerto Ricans are least equipped for the growing white collar job market. In 1968, Puerto Ricans comprised nearly one-third (31 percent) of the City's minority labor force, as listed in Table 30, but they provided over 10 percent of the blue collar skills and less than a quarter of the minority white collar skills.

Unemployment and Underemployment. Like the other major cities examined in Chapter 1, New York is afflicted with unemployment and underemployment, particularly in the low-income sectors of the City. However, the ratio of nonwhite to white unemployment was more favorable in New York City than in all but one of ten large cities studied by the Department of Labor in 1968. In fact, according to the Bureau of Labor Statis-

tics "the New York City nonwhite unemployment rate in 1968 was lowest among . . . ten cities."

Aside from unemployment, a major contributor to poverty is underemployment or sub-employment. The BLS defines the sub-employed as: those who are unemployed but actively seeking employment; those who are part-time employed looking for full-time employment; those who are fully employed but earning less than minimum wages; and half of all males aged 20 to

Table 31.

The Distribution of Earnings for Workers Employed in New York City, 1966.

Annual Earnings	(As a % of Total)			
	White Workers		Black Workers	
	Male	Female	Male	Female
Under \$5,000	39.4%	75.5%	72.0%	88.6%
\$5,000 — \$8,000	26.0	19.5	21.3	9.8
\$8,000 and Over	34.6	5.0	6.7	1.6
Total	100.0	100.0	100.0	100.0

Note: Earnings from employment by place of work which are equal to or greater than 80% of the total annual earnings of those recipients who were employed four quarters.

Source: Based on the Social Security Administration's continuous one-percent sample of the nation's workforce, edited and refined for New York City by the New York City-Rand Institute

Table 32.

Nonwhite and White Unemployment Rates in Ten Cities, 1968.

City	Unemployment Rate		Ratio of Nonwhite to White Rate
	Nonwhite	White	
New York	4.0%	2.9%	1.4
Houston	5.8	2.5	2.3
Philadelphia	6.1	2.9	2.1
Baltimore	6.5	3.7	1.8
San Francisco-Oakland	6.6	6.0	1.1
United States	6.7	3.2	2.1
St. Louis	7.0	3.4	2.1
Detroit	7.3	3.9	1.9
Chicago	7.4	2.7	2.7
Los Angeles-Long Beach	8.6	4.6	1.9
Cleveland	9.2	3.3	2.8

Source: U.S. Dept. of Labor, *Charting the New York City Economy*, Bureau of Labor Statistics, New York, N.Y. May, 1969, p. 10

Table 33.

Labor Force Participation Rates of New York City Residents by Race, Sex, and Age, 1968.

	Labor Force Participation Rate*	
	Male	Female
White, non-Puerto Rican	79.1%	44.6%
Under 25 years	59.7	50.3
25 to 54 years	98.2	52.9
55 and over	63.2	31.2
Black, Oriental, other nonwhite	78.8%	54.0%
Under 25 years	56.0	49.2
25 to 54 years	94.5	63.1
55 and over	61.1	37.7
Puerto Rican	78.6%	42.9%
Under 25 years	60.4	42.7
25 to 54 years	96.4	47.4
55 and over	40.7	25.9
Total	79.0%	45.8%

*Persons in labor force as a share of total noninstitutional population in ages 14 and over.
Source: Regional Plan Association based in part on New York State Department of Labor, *Manpower Directions, New York State, 1965-1975*.

64 who are not participating in the labor force. In the fall of 1966, sub-employment rates in selected poverty areas of New York City ranged from 28 to 33 percent, while unemployment rates were recorded from 6 to 9 percent in the same areas.

The City-wide scope of sub-employment is not known, and since first published for selected areas, the BLS has not issued sub-employment rates. The concept of sub-employment is perhaps more cyclical

than structural, reflecting as it does the prevailing economic condition which influences the employment rates and the ability of part-time workers to secure full-time employment. For the longer term, under the assumption of a full-employment economy and the continued disincentive in working for less than minimum wages, the concept of non-participation appears more valid. This less restrictive definition of underemployment, based on potentially employable persons

Table 34.
Estimated Characteristics of New York City Residents Not Participating in the Labor Force, 1970.

	Total	Residents Not in the Labor Force, (000's)		55 Yrs. & Over
		16-24 Yrs.	25-54 Yrs.	
Both Sexes, All Ethnic Groups				
Not in the Labor Force	2,507.9	522.3	858.7	1,126.9
Keeping House	1,581.0	138.6	737.1	705.3
In School	329.4	307.3	20.0	1.5
Unable to Work	141.4	13.9	45.5	82.0
Other	456.1	62.5	55.5	138.1
Retired	285.0			285.0
Other not Retired	171.1	62.5	55.5	53.1
Male, All Ethnic Groups				
Not in the Labor Force	667.1	228.8	82.5	355.8
Keeping House	25.7	1.6	2.4	21.7
In School	201.6	186.4	13.7	1.5
Unable to Work	78.3	5.2	26.9	46.2
Other	361.5	35.8	39.5	285.4
Retired	252.9			252.9
Other not Retired	108.6	35.6	39.5	33.5
Female, All Ethnic Groups				
Not in the Labor Force	1,840.8	293.5	776.2	771.1
Keeping House	1,555.3	137.0	734.7	683.6
In School	127.8	120.9	6.0	
Unable to Work	63.1	8.7	18.6	35.8
Other	94.6	26.9	16.0	51.7
Retired	32.1			32.1
Other not Retired	62.5	26.9	16.0	19.6
White non-Puerto Rican, Both Sexes				
Not in the Labor Force	1,787.9	316.8	530.0	941.1
Keeping House	1,186.4	80.7	475.2	630.5
In School	231.7	215.8	14.8	1.1
Unable to Work	39.1	6.3	12.9	20.8
Other	330.7	14.0	28.0	288.7
Retired	253.5			253.5
Other not Retired	77.2	14.0	28.0	35.2
Nonwhite, Both Sexes				
Not in the Labor Force	453.9	124.9	196.8	132.2
Keeping House	226.8	28.8	148.3	49.7
In School	57.0	53.4	3.4	2
Unable to Work	76.3	5.2	24.1	46.4
Other	93.8	36.9	21.0	35.9
Retired	23.6			23.6
Other not Retired	70.2	36.9	21.0	12.3
Puerto Rican, Both Sexes				
Not in the Labor Force	265.1	80.6	131.9	53.6
Keeping House	167.8	29.1	113.6	25.1
In School	40.7	38.1	2.4	.2
Unable to Work	26.0	1.2	9.4	14.8
Other	31.6	11.6	6.5	13.5
Retired	7.9			7.9
Other not Retired	23.7	11.6	6.5	5.6

*Total population aged 16 years and over not participating in the labor force.
Source: Regional Plan Association, based in part on U.S. Bureau of Labor Statistics.

of both sexes who are outside the labor force, can be spotted when the labor force participation rate--that is the proportion of the adult population which is either working or looking for a job--falls below prevailing averages. Table 33 shows the labor force participation rates of New York City residents in 1968 by race, sex and age.

It is evident that among males, the labor force participation rate of Blacks and other nonwhites in New York City is only very slightly lower than that of whites. Among females, the labor force participation rate of Blacks and other nonwhites is actually substantially higher than that of whites; particularly in the older age groups, a greater proportion of Black and other nonwhite women are in the labor force. Among Puerto Rican men, the pattern is similar to the other two groups (except that a smaller share of those over age 55 are in the labor force), while the participation rate of Puerto Rican women is significantly lower than that of either Black or white non-Puerto Ricans. On the whole, however, Table 33 reveals no very striking differences between the ethnic groups, so that this definition of underemployed must be viewed in another respect.

Previous data based on CAMPS studies indicated the potentially employable group in New York City to total about 170,000, compared to a labor force of 3,485,000, or about 5 percent. Estimates contained in Table 34 concur in magnitude by accounting for the size of the resident adult population of the City not participating in the labor force for various reasons. The bulk of the 2,508,000 residents who are unemployed but not seeking a job are females actively engaged in keeping house (62 percent of total). Another 13 percent of total are persons of both sexes currently enrolled in school, over 90 percent of whom are aged 16 to 24 years. Those who are unable to work are disproportionately nonwhite or Puerto Rican, while those who are retired are overwhelmingly white, which should be expected, given the higher incidence of ill health among Blacks and other minorities and the older age structure of the City's resident white population. Persons for whom no apparent reason for not seeking employment is given--or, alternatively, those who may be considered potential participants--number roughly 170,000, or 7 percent of the adult population outside the labor force.

Table 35 provides further detail on the group of non-participants residing in the City whose lack of physical disability, age, or alternative responsibility renders them potential candidates for participation in

the labor force. Presumably, some have never actively held or sought employment, while others, having done so, subsequently dropped out of the labor force. Over half of the total are nonwhite and Puerto Rican (55 percent), in sharp contrast to the ethnic composition of other non-participants or the labor force as a whole, in which minorities comprise less than 30 percent of total. Moreover, most are males (63 percent) and young to middle aged, with nonwhite male youths representing the largest single component.

Table 35.
Composition of New York City Residents Not Participating in the Labor Force for "Other not Retired" Reasons, 1970.

	Total	Persons (000's)		
		16-24 Yrs.	25-54 Yrs.	55 Yrs. & Over
White non-Puerto Rican	77.2	14.0	28.0	35.2
Male	49.7	2.1	24.2	23.4
Female	27.5	11.9	3.8	11.8
Nonwhite	70.2	36.9	21.0	12.3
Male	45.2	27.0	12.1	6.1
Female	25.0	9.9	8.9	6.2
Puerto Rican	23.7	11.6	6.5	5.6
Male	13.7	6.5	3.2	4.0
Female	10.0	5.1	3.3	1.6
All Ethnic Groups	171.1	62.5	55.5	53.1
Male	108.6	35.6	39.5	33.5
Female	62.5	26.9	16.0	19.6

	Total	As a Percent of Total		
		16-24 Yrs.	25-54 Yrs.	55 Yrs. & Over
White non-Puerto Rican	45.1%	8.2%	16.3%	20.6%
Male	29.0	1.2	14.1	13.7
Female	16.1	7.0	2.2	6.9
Nonwhite	41.0	21.5	12.3	7.2
Male	26.4	15.7	7.1	3.6
Female	14.6	5.8	5.2	3.6
Puerto Rican	13.9	6.8	3.9	3.2
Male	8.0	3.8	1.9	2.3
Female	5.9	3.0	2.0	0.9
All Ethnic Groups	100.0	36.5	32.5	31.0
Male	63.4	20.7	23.1	19.6
Female	36.6	15.8	9.4	11.4

Source: Regional Plan Association, based in part on U.S. Bureau of Labor Statistics

The distribution of potential participants by age and ethnic group clearly suggests that most are poor or near-poor, but trainable. A comparison with the CAMPS estimate of potentially employable non-participants, though equal in magnitude but different in composition, * further suggest that the level of these separate estimates represents a compatible determination of the number of low and unskilled residents of the City who are presently outside the labor force, receptive to training, and realistically employable should jobs be made available for them.

Support services and manpower training

As was pointed out earlier, two possible ways for poor families to rise above the poverty line are engagement of more secondary wage-earners in the labor force and skill upgrading. Both require a variety of support services, ranging from intensified educational programs at the preschool and school level to liberalized college entrance requirements with compensatory schooling; from organized recreation for youngsters to various counselling, or referral, or rehabilitation programs for returning veterans, the handicapped, ex-offenders, ex-addicts and other special groups; and career development agencies designed to create new categories of jobs, particularly in the areas of health care, education and social services. In this section, we shall deal only with two programs which most directly affect participation in the labor force and skill advancement.

Day care centers. Female welfare recipients who are heads of families are an important group which could be helped by the provision of day care facilities for children. A study conducted by Dr. Lawrence Podell in 1966 reported that 70 percent of all welfare mothers had stated their preference for working rather than staying home if they could be assured of adequate care for their children. The background of these mothers would indicate that this stated preference was accurate, since 80 percent had worked previously--one-third for ten years or more. But day care facilities are limited in New York City. In 1970, the enrollment in existing programs was as follows:

Table 36.
Day Care Programs in New York City.

Program	Children Enrolled
Dept. of Social Services Group and Family Day Care	14,000
Year-Round Headstart (Administered by the Community Development Agency)	5,700
Private Day Care and Nursery Schools	13,000
Total	32,700

Source: New York City Cooperative Area Manpower Planning System (CAMPS) Plan for Fiscal Year 1970-71, Sept. 12, 1970, p. 68

In addition, the Department of Social Services reimburses in-home "baby-sitter" costs (at a rate of \$10 a week per child) for welfare mothers who are employed or attending approved training programs. It is estimated that about 7,000 families use this service. As of February, 1970, 7,000 children were on waiting lists for publicly-aided day care services. Undoubtedly, there are thousands of other children in need of day care or nursery school, not only in welfare families, but in households whose head earns near the poverty level, and who might be able to free a second wage-earner to supplement the family income if child care responsibilities could be shifted to a publicly funded agency.

Manpower training. As noted earlier in this chapter, the New York City Cooperative Area Manpower Planning System (CAMPS) estimates that in the 1970-71 fiscal year, at least 745,000 persons were in need of job training, either because they are now not in the labor force (171,200); are poor and unemployed (130,000); or are employed at salaries at or below poverty level (444,200). Presently, over \$100 million is expended each year on manpower and related educational and training programs in the City. According to CAMPS:

For the most part, these programs have been designed to meet specific needs and have been funded on an individual basis from a variety of sources. They do not, at present, constitute a single coherent 'system' of manpower services.

CAMPS came to this conclusion after conducting a survey of manpower programs currently serving the City. The two major agencies in charge of these programs at the local level are the New York State Employment Service (NYSES) and New York City Manpower and Career Development Agency (MCDA). In examining the characteristics of the population served by these agencies, one finds that half of the "intakes" are male; almost half are under 22 years of age; from 46 percent to 69 percent are Black; an

* The CAMPS estimate of potentially employable non-participants contains female welfare recipients who would be expected to fall within the category of keeping house. It should be recalled, however, that the overall CAMPS poverty population is not fully representative of the City's pool of poor and near-poor persons, whereas the total number of persons outside the labor force for apparent reason, as shown in Tables 34 and 35, undoubtedly contains some who are neither poor, near-poor, nor trainable. Thus, accounting for these discrepancies, the separate estimates appear to be in agreement as to the overall pool of low-income, potentially employable non-participants residing in the City.

estimated 31 to 46 percent are Spanish-speaking; and about 78 percent are not high school graduates. This information for both programs is summarized below:

Table 37.
Characteristics of Combined Intakes, NYSES and MCDA, New York City 1970.

Characteristics	Percent of Total Intake by Program		
	NYSES	MCDA/PRCDP*	Combined Average
Sex:			
Male	58%	43%	50%
Female	42	57	50
Age:			
Under 22	50	44	48
22-44	38		42
45 or older	12	56	10
Ethnic:			
Black	69	46	60
Spanish-speaking	31	46	30
White, other		8	10
Education:			
Non-H.S.	77	79	78
H.S. Grads	23	21	22
Total Number	104,500	97,000	201,500

*Puerto Rican Community Development Project, which accounts for 22,000 of the total 97,000 enrollees in MCDA.

Source: CAMPS, *Plan for Fiscal Year 1970/71*, September, 1970, p. 60.

There are two major types of job-related training programs: those where training is conducted in a classroom setting either through a manpower agency or subcontracted to educational institutions; and on-the-job training (OJT) programs, where an employer hires the applicant and conducts training. Separate programs serve youthful trainees. Under the first type of training (called "institutional") there were sixteen major programs in operation in New York City in 1970, with a total enrollment estimated by various program directors, of 43,012 and costing slightly under \$78.5 million. The largest of these is the Work Incentive Program (WIN) serving 9,300 trainees; another 7,000 people were served by MCDA Regional Opportunity Centers in 1970. In institutional training, trainees learn a variety of skills, including clerical, office machine operation, clerk and record-keeping procedures and some machine operations related to the aviation, refrigeration and other industries. Referrals can then be made to specific employers. Many of the institutional training programs concentrate on remedial education in such areas as mathematics and English, in order to prepare trainees for such entry-level jobs as grocery checker, general clerk and other sales occupations. A summary of the largest institutional programs appear in Table 38.

The employer-supervised on-the-job (OJT) programs include Coalition JOBS (Job Opportunities in the Business Sector), a Manpower Administration program

which trains workers for an existing job and in most cases, guarantees that they will continue in this job at the normal rate of pay after training. A summary of this and other OJT programs follows in Table 39.

Table 38.
Enrollment and Funding for Agency-Supervised ("Institutional") Manpower Programs, Fiscal Year 1970, New York City.

Program	Est. Total Enrollment	Est. Total Funds (000's)
Work Incentive (WIN)	9,260	\$13,683
MCDA Regional Opportunity Centers	7,000	16,300
Adult Basic Education	4,000	900
Welfare Education	4,000	1,200
MDTA Institutional Training	3,971	18,000
Model Cities	3,700	18,477
Subtotal	31,931	68,560
All Other	11,081	9,906
Total	43,012	78,466

Source: CAMPS, *Plan for Fiscal Year 1970/71*, September, 1970, p. 64.

Table 39.
Estimated Enrollment and Total Funds for On-the-Job Training Programs, New York City, Fiscal Year 1970.

Program	Est. Total Enrollment	Est. Total Funds (000's)
JOBS ^a (Non-Contract)	15,000	\$ — ^b
JOBS ^a (Contract)	10,000	20,000
MDTA-SMTA-OJT Projects	4,370	5,000
Civil Service Career Development	1,975	2,648
Area Redevelopment (B'klyn. Navy Yard)	1,700	285
Subtotal	33,045	27,933
All Other ^c	2,615	9,594
Total	35,660	37,527

^a Jobs in the Business Sector

^b Sponsored by employers.

^c Includes only those for which estimates were available.

Source: CAMPS, *Plan for Fiscal Year 1970/71*, September, 1970, p. 64.

From the estimates above, obtained by CAMPS from program directors, it would appear that 78,700 people were enrolled in institutional and OJT programs, at a total cost of \$116 million, in fiscal year 1970. CAMPS, however, points out that these figures represent total estimates before the end of the year and include all who enrolled during the year, whether or not they completed training. Double-counting may occur too, when a given trainee transfers from one program to another, or enrolls in several programs during the year. Taking these factors into account, CAMPS comments:

At present, there is no systematic way of correcting for these factors. In reality, the total number of persons actually served by New York City's agency- and employer-supervised training and educational programs... is probably somewhere between 50,000 and 60,000 rather than... 78,672...

Estimates of the numbers of youth served by training programs vary between 50,000 and 70,000, and CAMPS reports that about three-quarters of these programs are for summer jobs only, with almost half of the remainder in four Cooperative Education (work-study) programs.

It is obvious that of the CAMPS estimate of over 745,000 New Yorkers as an appropriate target group for manpower training, only 8-10 percent are currently being served. Even those who do benefit from training programs are often not guaranteed a full-time job upon completion of training. Moreover, a large segment of those poverty residents who are now employed but who earn poverty-level wages cannot benefit from training which might enable them to upgrade their skills. This is mainly due to the fact that most manpower programs and referral agencies operate during the day.

Even if this major problem--upgrading the skills of the full-time employed poor--is solved, there simply is not enough training for appropriate jobs in the City today. Moreover, drop-out rates in current programs are fairly high and gaps in job market information have effectively cancelled the benefits of some programs, adding to the discouragement of newly trained workers with no place to go. It is for these reasons that manpower experts have long felt that training should be linked to specific employment opportunities; should be OJT oriented, with public financial support to reimburse an employer for the cost of training; and should provide the kind of support services, such as transportation links, which are instrumental in improving job retention rates.

The company-sponsored segment of Coalition JOBS does build-in some safeguards. In 1969, this program reported that before training, almost 60 percent of 7,400 trainees in 92 companies had earned less than \$2.00 per hour. According to CAMPS:

Post-training wages varied more widely. About half (45 percent) of the trainees could look forward to earning at least \$2.40 per hour by the end of training; one in three (31 percent) could expect to earn from \$2.00 to \$2.30 per hour. However, one in seven (14 percent) would still be earning below \$2.00 even after training.

So far, even the JOBS program has not concentrated fully enough on those parts of the labor market which are growing. The "new careers" which have

begun to grow in the City, particularly in the health professions, are increasingly appearing in the course schedules of training agencies. Basic office skills are also beginning to account for more trainees--an appropriate program for the largest job growth sector in the City. Sales training and repair and maintenance skills are being taught, and these too, are appropriate for City workers.

Existing programs of manpower development have to bear the brunt of improving job opportunities, but equally, these programs suffer from a number of drawbacks which must be solved to insure that adequate education and training, for jobs which exist, are linked to the proper support services and available to all who need them. Some shortcomings of current training programs include:

- An insufficient relationship between a training program and "real" jobs;
- Confusion among the many agencies involved in training and inadequate central control over placement;
- Poor referral and follow-up;
- No training or skill upgrading for the employed poor who work full-time;
- Few supportive services, in the areas of child care, health referral and transportation.

Location of poverty areas

As was pointed out previously, the poor in New York City number slightly over 1 million by the more restricted Census Bureau definition, and almost 2.5 million if one includes the near-poor, by the more liberal Bureau of Labor Statistics definition. Most other estimates fall between these two definitions. Because of historic patterns of housing location and succession, because of segregation by income and ethnic group, the poor are not uniformly distributed throughout the City, but rather concentrated in two huge areas, one in the north, the other one in the south. The northern area starts above 96th Street on the East Side of Manhattan, and extends through Harlem roughly to the George Washington Bridge, and across the Harlem river into the Bronx, encompassing most of the Borough south of Fordham Road. The southern area starts on the Lower East Side of Manhattan--historically a symbol of poverty in the City--

and extends across the East River into Brooklyn, all the way to the Queens boundary and the flatlands along Jamaica Bay, forming a triangle that is bounded by the Newtown Creek Industrial area in the north and by Prospect Park in the south. Apart from these two major concentrations, there are isolated low-income pockets in Queens (in Long Island City, South Jamaica, in the Rockaways), on Coney Island, and along the north shore of Staten Island. Drawing accurate boundaries around low-income areas may be as elusive as

defining poverty, but several working definitions can be offered.

The following series of Maps and Tables portray the location and dimension of low-income areas in New York City, as defined by public anti-poverty agencies and independent statistical criteria. Map 20 and accompanying Table 40, compare the poverty area designations of the Council Against Poverty and the Model Cities Program, two umbrella organizations of the City government which are responsible for allocating

Table 40.

New York City Poverty Areas, as Designated by the Council Against Poverty and the Model Cities Program.

New York City Council Against Poverty				New York City Model Cities Program				
Key	Area	Population 1968 (000's)		Key	Area	Population 1965 (000's)		Unempl. Rate '65
		Total	Minority ^a			Total	Minority ^a	
1	Tieman	112.7	62.3					
2	Morrisania	160.4	137.0	A	Morrisania	44.2	39.2	8.8%
3	South Bronx	125.7	90.2	B	South Bronx	76.7	54.7	8.7
4	Hunts Point	199.6	167.3	C	Hunts Point	170.0	134.0	9.3
	Bronx Poverty Areas	598.4	456.8		Bronx Model Cities	290.9	227.9	9.1
	Bronx Borough Total	1,509.1	626.6		Program Areas			
	As a Percent of Borough	39.7%	72.9%		1970 Census count	240.8		
5	Upper West Side	147.3	99.4					
6	Central Harlem	156.8	156.0	D	Central Harlem	87.3	85.8	8.3
7	East Harlem	139.9	120.9	E	East Harlem	120.9	95.2	10.0
8	Mid West Side	152.9	45.7					
9	Lower West Side	172.8	30.4					
10	Lower East Side	171.9	82.5					
	Manhattan Poverty Areas	941.6	534.9		Manhattan Model Cities	208.2	181.0	9.2
	Manhattan Borough Total	1,462.0	592.5		Program Areas			
	As a Percent of Borough	64.4%	90.3%		1970 Census count	181.3		
11	Williamsburg	194.6	107.3					
12	Fort Greene	86.2	58.0					
13	Bushwick	110.2	36.2					
14	Bedford Stuyvesant	300.8	278.6	F	Bedford Stuyvesant	250.3	223.9	6.4
15	Crown Heights	127.2	80.9					
16	Brownsville	121.1	90.8	G	Brownsville	130.1	100.4	9.6
17	East New York	163.9	76.3	H	East New York	41.8	21.8	9.1
18	South Brooklyn	199.7	67.9					
19	Sunset Park	89.8	21.2					
20	Coney Island	26.7	6.4					
	Brooklyn Poverty Areas	1,420.2	823.8		Brooklyn Model Cities	422.2	346.1	7.6
	Brooklyn Borough Total	2,665.8	929.0		Program Areas			
	As a Percent of Borough	53.3%	88.7%		1970 Census count	364.4		
21	Long Island City	41.6	11.7					
22	Corona-East Elmhurst	41.5	19.6					
23	South Jamaica	161.9	96.4					
	Queens Poverty Areas	245.0	129.7					
	Queens Borough Total	2,066.7	283.6					
	As a Percent of Borough	11.9%	45.7%					
24	Staten Island Pockets	n.a.	n.a.					
25	Rockaway Pockets	n.a.	n.a.					
26	Bronx River Pockets	n.a.	n.a.					
	New York City Poverty Areas	3,205.2	1,945.2		New York City Model Cities	921.3	755.0	6.4%
	New York City Total	7,984.5	2,447.4		Program Areas			
	As a Percent of City	40.1%	79.5%		1970 Census count	786.5		

^a Black, Oriental, other nonwhite and Puerto Rican

Note: In addition to the Council Against Poverty estimates of the number of minority residents in poverty areas, it is estimated that 23 percent of the New York City population in 1970 was comprised of Black and other non-white persons, the Bronx and Brooklyn with 27 percent, Manhattan 30 percent, Queens 15 percent, and Staten Island 6 percent.

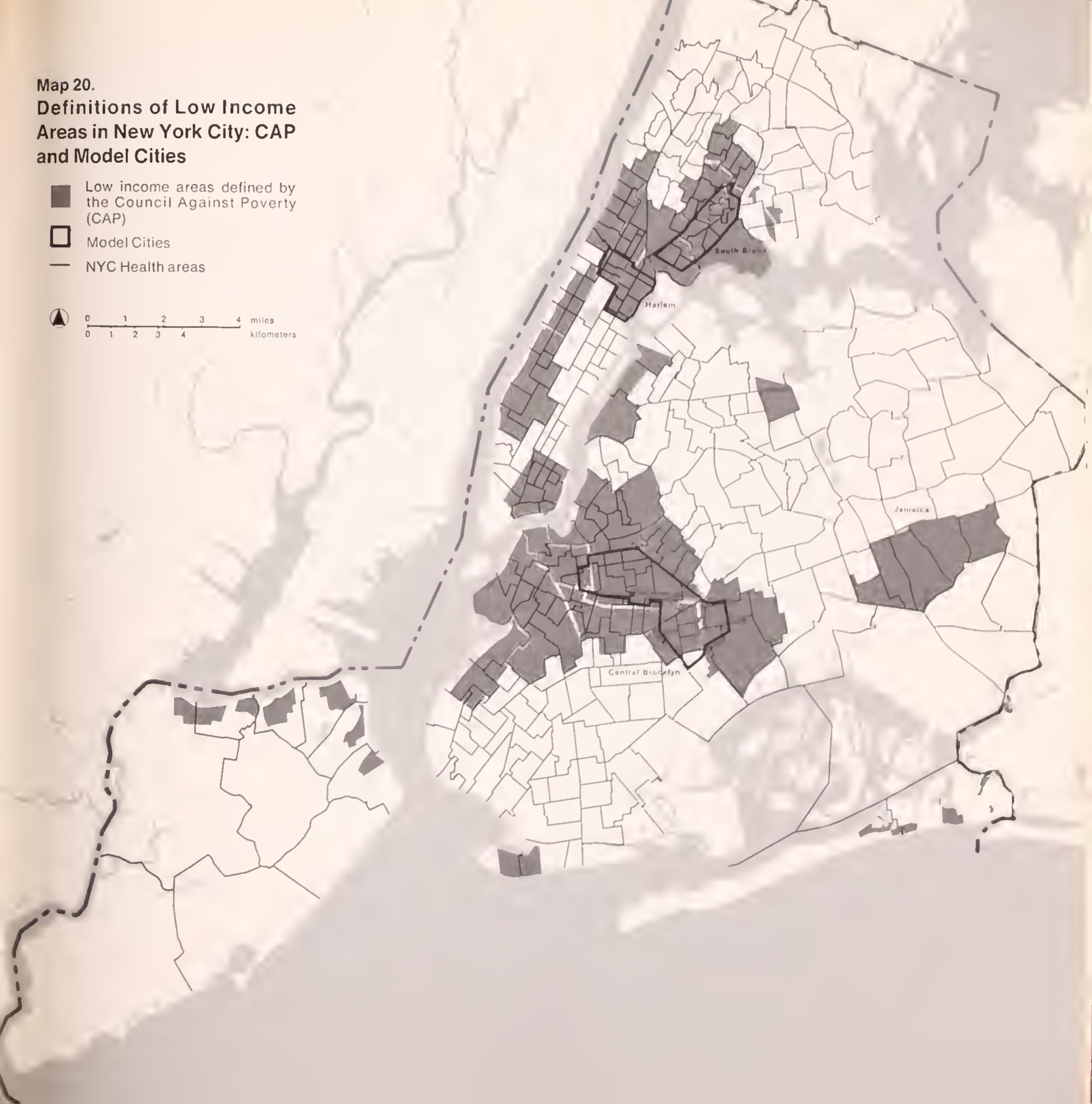
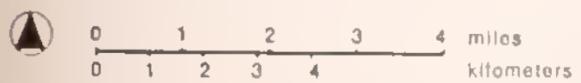
Source: New York City Council Against Poverty, New York City Department of City Planning, and Regional Plan Association

Map 20.
Definitions of Low Income
Areas in New York City: CAP
and Model Cities

■ Low income areas defined by
the Council Against Poverty
(CAP)

□ Model Cities

— NYC Health areas



the bulk of federal and local poverty funds to member community corporations and committees, which plan and develop ghetto areas. The 26 Council Against Poverty areas shown on the Map, each with a non-profit community corporation, were designated by the City after an intensive evaluation of neighborhood social and economic characteristics. Together, the areas comprise over 3 million persons, or 40 percent of the City's total population and 80 percent of its minority residents. Nearly two-thirds of Manhattan's population live in designated poverty areas, but Brooklyn's 10 Council Against Poverty communities represent the largest share of poverty dwellers in New York. In 1968, the anti-poverty expenditures of the community corporations and the Council Against Poverty amounted to some \$60 million, dispensed primarily for social service programs in manpower training, family counseling, consumer education, and recreation, though considerable effort in coordinating local developments in health, education, and housing also ranked among the achievements of the Council's community corporations.

Because of federal regulations, restricting the portion of city population qualifying for Model Cities funding, the 8 Model Cities areas listed in Table 40 comprise a much smaller share of New York. Nearly one million people reside within the designated areas, all are contained within the more extensive Council Against Poverty jurisdiction, and again, Brooklyn re-

presents the largest component of poverty population. The Model Cities program, built on community committees which participate in planning development projects, has proven to be an effective anti-poverty device because of its authority to fund direct attacks on the elemental problems of housing, health, and education. In 1969, \$65 million in federal funds were allocated to Model Cities projects in New York. The achievements of the Brooklyn program, operating in Bedford-Stuyvesant, Brownsville, and East New York, are illustrative of the Model Cities effort: 14,000 new housing units and 4,000 rehabilitated units were authorized; several health centers, multi-service centers and a cultural center were planned or modernized; and, programs for preschool through adult education were initiated.

Map 21, and accompanying Table 41, depict the location of poverty in New York City by the distribution of the public assistance caseload by health area in 1967. As of that date, 9 percent of the City's population received welfare payments and, as both Map and Table show, the overwhelming portion of recipients were concentrated in rather compact portions of the Bronx, Manhattan, and Brooklyn. Indeed, within these boroughs, the darkest shaded areas, where 30 percent or more of the residents were public assistance cases, comprised roughly one-fifth (19 percent) of the City-wide welfare load, but less than 5 percent of the total

Table 41.
Poverty Areas in New York City, as Defined by the Distribution of Public Assistance Recipients, 1967.

Borough	Areas where % of Population on Welfare is:	Resident Population	Welfare Recipients	% Recipients		% of Total	
				Ave.	Range	Pop.	Recip.
Bronx	30% and Over	142,640	46,507	32.6%	30-36%	9.5%	25.2%
	15 to 30%	426,360	102,259	24.0	17-30	28.2	55.4
	Under 15%	940,100	35,782	3.8	1-15	62.3	19.4
	Total	1,509,100	184,548	12.2		100.0	100.0
Manhattan	30% and Over	75,650	25,135	33.2%	31-39%	5.2%	15.7%
	15 to 30%	346,770	79,779	22.9	16-30	23.8	49.9
	Under 15%	1,037,580	54,866	5.3	1-14	71.0	34.4
	Total	1,462,000	159,780	10.9		100.0	100.0
Brooklyn	30% and Over	150,170	63,072	42.0%	33-86%	5.6%	20.5%
	15 to 30%	764,080	166,533	21.2	16-30	29.4	54.1
	Under 15%	1,731,550	76,155	4.5	0-15	65.0	25.4
	Total	2,665,800	307,760	11.5		100.0	100.0
Queens	15 to 30%	38,610	7,020	16.1%	18%	1.9%	14.9%
	Under 15%	2,027,690	39,969	2.0	1-15	98.1	85.1
	Total	2,066,700	46,989	2.3		100.0	100.0
Statens Island	Under 15%	280,900	6,156	2.2%	1-4%	100.0%	100.0%
	Total	280,900	6,156	2.2		100.0	100.0
New York City	30% and Over	368,460	134,714	36.6%	30-86%	4.6%	19.1%
	15 to 30%	1,598,020	355,591	22.3	16-30	20.0	50.4
	Under 15%	6,016,020	214,928	3.6	0-15	75.4	30.5
	Total	7,984,500	705,233	8.8		100.0	100.0

Source: Regional Plan Association, based on data from New York City Department of Social Services

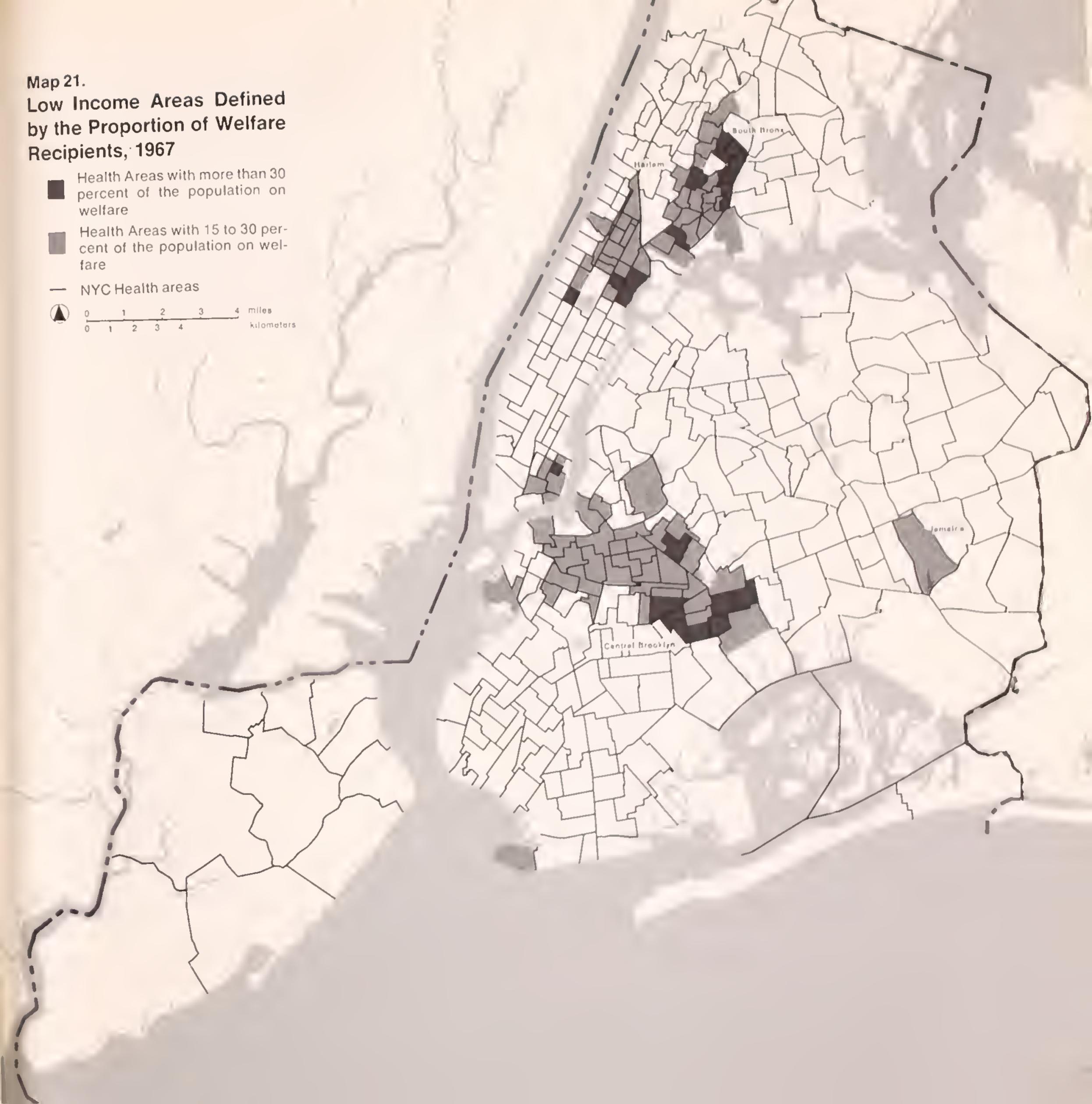
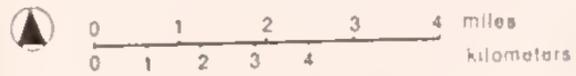
Map 21.

**Low Income Areas Defined
by the Proportion of Welfare
Recipients, 1967**

■ Health Areas with more than 30 percent of the population on welfare

■ Health Areas with 15 to 30 percent of the population on welfare

— NYC Health areas



population. The shaded areas of middle value, where 15 to 30 percent of the residents were on welfare, define the larger poverty communities which house 50 percent of the public assistance recipients, but only 20 percent of the City's population. In the rest of New York, less than 4 percent of the total residents, who comprise 75 percent of the City population, received welfare in 1967. As Table 41 further shows, the greatest number of public assistance recipients were to be found in Brooklyn (44 percent), followed by the Bronx (26 percent), and Manhattan (23 percent).

Map 22, and accompanying Table 42, present a third definition of low-income areas in New York City, based upon the federal income tax reportings of 1966 by postal Zip code area. Imperfect as this measure

may be, it nonetheless contributes to an overall consensus and affords some new insights on low-income levels in the City as well. In 1966, the adjusted gross income of New York residents was \$23 billion and the percapita income was \$2,971. The lowest-income (or darkly shaded) areas, concentrated mainly in the Bronx, Manhattan, and Brooklyn, reported a percapita income a full one-third below the City average; lower middle-income areas, of middle value, fell one-eighth below and the rest of New York averaged one-sixth above the City-wide percapita norm. The lowest-income areas, with one-quarter of the City's population on less than one-fifth of the available land area, were the most densely settled (43,500 persons per square mile). With some exceptions, notably

Table 42.
Low-Income Areas in New York City, As Defined From Federal Income Tax Returns, 1966.

Borough	Area	Avall. Land (Sq. Miles) ^a	Reported Popula- tion ^b	Population		Reported Income (000's) ^c	Income		Per- capita Income	Returns Under \$3,000 ^d	
				Per Sq. Mile	As % of Borough		Per Square Mile (000's)	As % of Borough		As % of Total	As % of Income
Bronx	Low-Income	8.6	436,570	50,760	31.1%	\$750,500	\$87,270	23.0%	\$1,719	34.4%	11.9%
	Lower										
	Middle-Income	4.7	259,630	55,240	18.5	619,060	131,720	18.9	2,384	28.3	7.5
	Rest of Borough	19.5	706,900	36,250	50.4	1,896,650	97,260	58.1	2,683	25.2	5.6
	Total	32.0	1,403,100	42,780	100.0	3,266,210	99,580	100.0	2,328	28.5	7.4
Manhattan	Low-Income	9.2	679,690	73,880	41.5%	51,534,920	5166,840	20.6%	52,258	35.2%	10.3%
	Harlem	6.0	485,650	80,940	29.7	989,320	164,890	13.3	2,037	36.2	11.9
	Lower East Side	2.8	172,080	61,460	10.5	443,730	158,480	5.9	2,579	32.8	8.0
	Lower										
	Middle-Income	1.6	135,660	84,790	8.3	493,570	308,480	6.6	3,638	29.1	5.8
	Rest of Borough	8.7	820,930	94,360	50.2	5,420,200	623,010	72.8	6,603	23.8	2.8
	Total	19.5	1,636,280	83,910	100.0	7,448,690	381,980	100.0	4,552	28.5	4.5
Brooklyn	Low-Income	18.1	722,260	39,900	27.9%	51,283,300	570,900	20.7%	51,777	35.3%	11.6%
	Central Brooklyn	16.6	681,490	41,050	26.3	1,186,550	71,480	19.1	1,741	35.6	12.0
	Coney Island	1.5	40,770	27,180	1.6	96,750	64,500	1.6	2,373	31.0	6.9
	Lower										
	Middle-Income	13.9	507,140	36,480	19.6	1,288,420	92,690	20.7	2,541	27.9	6.8
	Rest of Borough	30.7	1,361,660	44,350	52.5	3,639,550	118,550	58.6	2,673	25.2	5.6
	Total	62.7	2,591,060	41,320	100.0	6,211,270	99,060	100.0	2,397	28.4	7.1
Queens	Low-Income	8.3	84,090	10,130	4.3%	5193,190	523,280	3.4%	52,297	31.5%	7.1%
	Long Island City	3.2	19,770	6,180	1.0	48,950	15,300	.9	2,476	30.9	7.2
	South Jamaica	1.6	17,630	11,020	.9	33,410	20,880	.6	1,895	33.8	9.9
	Far Rockaway	3.5	46,690	13,340	2.4	110,630	31,670	1.9	2,374	30.8	6.3
	Lower										
	Middle-Income	5.5	139,440	25,350	7.2	332,900	60,530	5.9	2,387	28.2	6.8
	Rest of Borough	68.1	1,720,140	25,260	68.5	5,133,360	75,380	90.7	2,984	23.4	4.6
	Total	81.9	1,943,670	23,730	100.0	5,659,470	69,100	100.0	2,912	24.1	4.8
Staten Island	Lower										
	Middle-Income	2.6	11,020	3,930	4.1%	\$23,670	56,530	3.4%	52,167	27.2%	6.4%
	Rest of Borough	36.1	257,770	6,770	95.9	686,500	16,070	96.6	2,671	22.4	4.3
	Total	40.9	266,790	6,570	100.0	712,370	17,420	100.0	2,650	22.6	4.4
New York City	Low-Income	44.2	1,922,610	43,500	24.5%	\$3,761,910	\$85,110	16.2%	\$1,957	34.9%	10.9%
	Lower										
	Middle-Income	26.5	1,052,890	36,940	13.4	2,757,620	96,770	11.8	2,619	28.2	6.8
	Rest of City	165.1	4,867,400	29,480	62.1	16,776,260	101,620	72.0	3,447	24.1	4.3
	Total	237.6	7,642,900	32,960	100.0	23,296,010	97,970	100.0	2,971	27.2	5.7

^a Total Land Area less parks

^b Population as reported on Federal Income Tax Returns

^c Adjusted Gross Income as reported on Federal Income Tax Returns

^d Returns which reported Adjusted Gross Income less than \$3,000, Deficit Income, or Income equivalent to Loss.

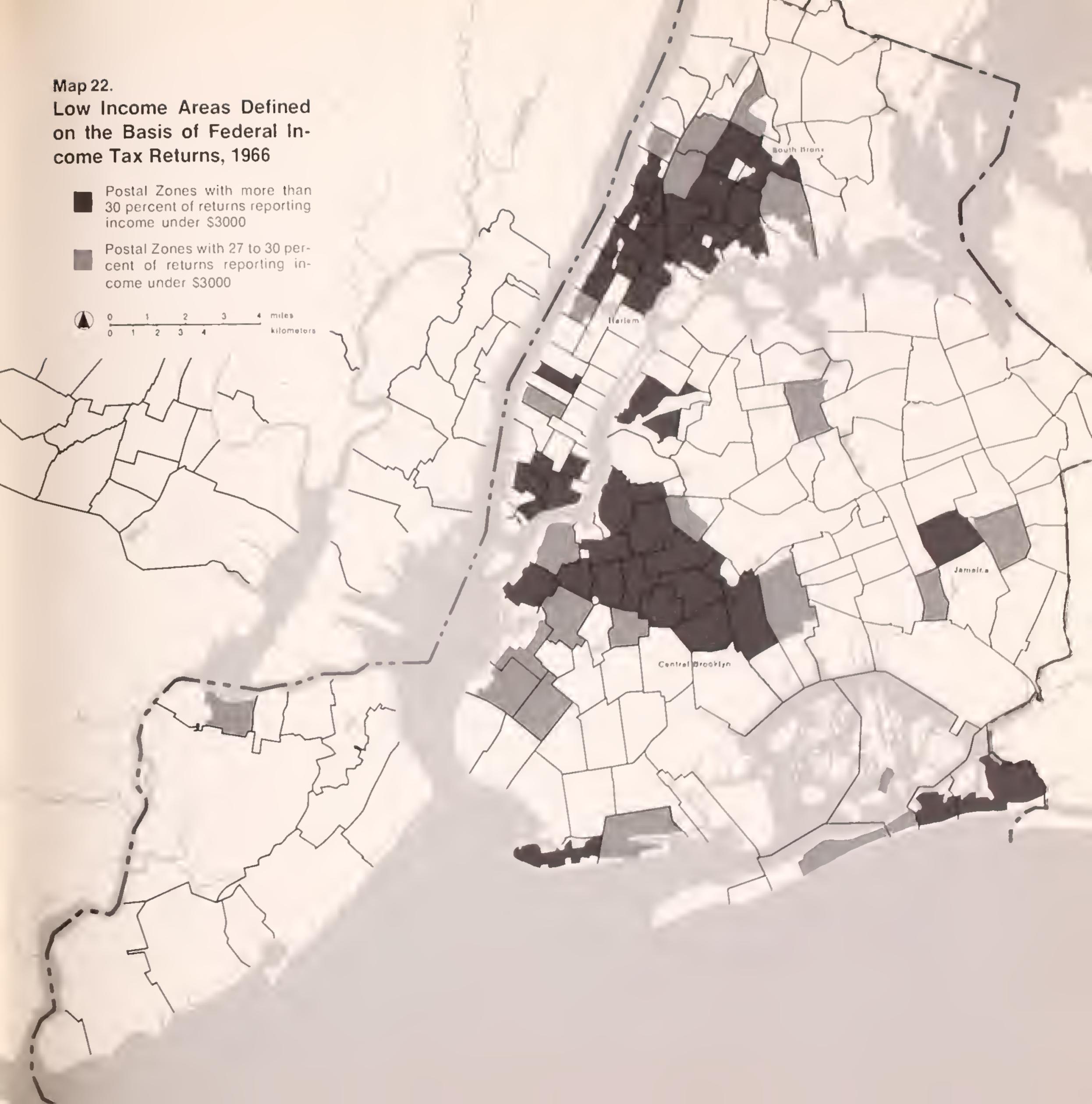
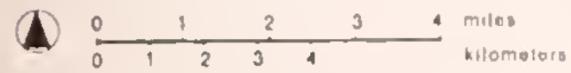
Note: The data on which this table is based is subject to inaccuracies in taxpayer reporting as well as certain systematic data processing errors. The distribution of income by Zip code was affected by the classification of some returns by place of business rather than residence, and by the absence of Zip code identifications for a portion of returns filed within each borough.

Source: Regional Plan Association, based on U.S. Department of Treasury, Internal Revenue Service data, as computed by Larry Smith & Company, Inc.

Map 22.

Low Income Areas Defined
on the Basis of Federal In-
come Tax Returns, 1966

- Postal Zones with more than 30 percent of returns reporting income under \$3000
- Postal Zones with 27 to 30 percent of returns reporting income under \$3000



In Manhattan, the overall density of settlement falls in the City, as per capita income rises (to an average low under 30,000 persons per square mile). But even if population density tends to bear an inverse relationship to per capita income, the density of aggregate income understandably bears a direct relationship. As Table 42 shows in City-wide averages, the concentration of income per square mile increases from \$85 million in the lowest-income areas to over \$100 million in the middle- and upper-income areas; in portions of Manhattan, gross income exceeds a half billion dollars per square mile. Despite the obvious wealth of many Manhattan residents, this borough has the greatest share of total population residing within low-income districts (42 percent of total); Brooklyn, however, accounts for the largest number of poor people in the City, with three-eighths of the population in the lowest-income areas defined on Map 22; the Bronx, with less than a third of its population in low-income areas representing more than a fifth of the City total, ranks poorest when measured in terms of per capita income.

The poverty income gap

In 1968, nearly one million families and unrelated individuals residing in New York City subsisted on incomes below the lower level of living standard defined by the Bureau of Labor Statistics for a given family size. Impoverishment by this definition affected 31 percent of the City's population, or 2.5 million persons, who received just under 10 percent of the aggregate money income of all residents. Were these impoverished people to have shared in the distribution of income at a level which would have assured them of at least a minimum standard of living (the BLS threshold), then the share of aggregate money income at their disposal would hypothetically have been 16 percent of the total in 1968. Or, alternatively, the prevailing level of City-wide money income would have been increased by over 6 percent if poverty defined by this standard had been eliminated. Expressed in current dollars, the amount of money income required to raise the impoverished to a minimum standard of living in New York City--that is, the City's poverty income gap--was \$1.6 billion in 1968 and about \$2.0 billion in 1971. Table 43 provides the estimates.

Table 43.
The Poverty Income Gap in New York City, 1968.^a

Poor and Near-Poor City Residents	
Number of Families and Unrelated Individuals	951,740
Estimated Aggregate Money Income	\$2,550,000
Wage, Salary & Related	\$1,500,000
Public Assistance	\$ 800,000
Other Social Insurance	\$ 250,000
Aggregate Money Income Requirement for BLS Lower Level-of-Living Budget	\$4,180,000
The Poverty Income Gap	\$1,630,000

^a Computed from Current Population Survey, 1968 Income Distribution, New York City.
Source: Regional Plan Association.

When compared to the level of poverty-related appropriations in the New York City Expense Budget, and to the sixfold growth which they have experienced over the period 1959 to 1971, as depicted in Table 44, it is instructive to note that the poverty income gap was roughly equivalent to the combined appropriations for health and social services in 1968. Elimination of poverty through a direct income subsidy of this magnitude would provide immediate relief, even if a continuous annual cost would be involved. Elimination of poverty through immediately more expensive programs of manpower training and job creation, could, in the long run, transfer the means for closing much of the poverty gap to the poor themselves, as indicated in the beginning of this report.

Table 44.
Poverty-Related Appropriations in the New York City Expense Budget, Fiscal Years 1959/60-1971/72.

Year	In Millions			Total Expense Budget	As % of Total
	Social Services (Welfare)	Health Services	Poverty Related Subtotal		
1959/60	\$254	\$183	\$437	\$2,175	20.1%
1960/61	246	199	445	2,345	19.0
1961/62	295	222	517	2,542	20.3
1962/63	298	252	550	2,785	19.7
1963/64	339	278	617	3,083	20.0
1964/65	416	293	709	3,355	21.1
1965/66	494	352	846	3,875	21.8
1966/67	654	392	1,046	4,554	23.0
1967/68	918	482	1,400	5,178	27.0
1968/69	1,346	530	1,876	5,994	31.3
1969/70	1,519	570	2,089	6,579	31.8
1970/71	1,712	710	2,422	7,709	31.4
1971/72	1,947	768	2,735	8,566	31.9

Note: Excludes debt service, pensions and extra budgetary funds.
Source: Citizens Budget Commission.

CHAPTER 4. TRANSPORTATION SERVICE

Having pinpointed the magnitude and location of existing and potential job opportunities, and the magnitude and location of the underprivileged labor pool, we can now turn to the link between place of employment and place of residence--namely, transportation. In this chapter, we shall first survey overall journey-to-work patterns in the City and the Region, with an emphasis on travel behavior by income group, then turn to the individual transportation systems, with an emphasis on how they do or can serve poverty areas, and finally explore the influence--if any--of transportation accessibility upon economic status.

The journey to work: geographic patterns

Until information from the 1970 Census becomes fully available, 1960 Census data, as retabulated by Regional Plan Association, provide the most inclusive definition of travel to work in the 31-county New York Urban Region. These include 1960 workers by place of residence and by place of work, broken down into three income groups, as well as their movements between geographic areas, or "zones" within the Region.* It should be noted that the concept of "workers", as used by the Census, differs from the concept of "employment" dealt with earlier in Chapter 2. "Employment" refers to positions or jobs, estimated on the basis of economic statistics, whereas "workers" in the Census definition as used below, refers to individuals who worked at least 15 hours a week and were at work dur-

* The interchanges among 75 fairly large zones (including 5 counties in New York City) are obtained directly from the Census, those among 177 smaller scale zones (including 36 in New York City) are synthesized from estimated small area employment and a mathematical distribution model of work-trips within the framework of Census control totals.

ing the week preceding the Census interview, or had such a job but were temporarily absent. This definition thus excludes dual jobs as well as the unemployed, and makes the total number of workers in the Region by place of work and by place of residence identical.

The overall relationships between the City and the Region in 1960 are summarized in Table 45. It is evident that slightly over 7 million workers lived and worked in the Region. The amount of commuting to and from neighboring metropolitan areas was very small (57,000 or 0.8 percent), so that the Region did represent a self-contained labor market. Of the Region's 7 million workers, 3.3 million lived in New York City; in round numbers, 145,000 of these were reverse commuters to jobs in the suburbs, while 535,000 suburban residents commuted to New York City. Thus, the total number of workers working in New York City was close to 3.7 million; half of them, or 1.85 million, worked in the Manhattan Central Business District.

The Manhattan CBD was also the major destination for workers living in the City--46 percent of them worked there. Among residents of Manhattan Borough, 70 percent worked in the CBD; among residents of Queens, 43 percent; Bronx, 39 percent; Brooklyn, 34 percent and Staten Island, 32 percent. As for suburban commuters into New York City, 65 percent of them were destined for the Central Business District.

Following the Manhattan CBD, one's own borough outside the CBD was the next most important place of work for New York City residents: It accounted for 40 percent of their destinations. Thus, 57 percent of Brooklyn residents worked in Brooklyn, and 56 percent of Staten Island residents worked on Staten Island. The Bronx and Queens, by contrast, exported the majority of their workers, and only about 40 percent in each case worked in their own borough.

Journey-to-work flows among boroughs outside the Manhattan CBD accounted for less than 10 percent

of the destinations of all workers residing in the City. The largest flow in this group was from Queens to Brooklyn, accounting for 9 percent of the workers living in Queens; Brooklyn, in turn, sent 4 percent of its resident workers to Queens. The Bronx sent about 3 and 2 percent of its workers to Queens and Brooklyn, respectively. These small numbers can be explained by the fact that job opportunities in another borough outside the CBD are unlikely to be markedly different from those in one's own, and are not worth the generally time-consuming and inconvenient trip.

Reverse commuting from New York City to suburban counties accounted, in 1960, for less than 5 percent of the resident workers; the proportions by borough ranged from about 3 percent in Manhattan and Brooklyn to between 5 and 7 percent in the Bronx, Queens and Staten Island. One-third of all the outbound commuters originated from Queens. The major destination of the outbound commuters was the ring of counties or parts of counties more or less surrounding New York City, defined in Table 45 as the Adjacent Ring, which includes Nassau, southern Westchester, Bergen, southern Passaic, Essex, Union and Hudson counties. This area, generally within 25 to 30 miles of Manhattan, attracted some 86 percent of the outbound commuters. The next, or Intermediate Ring, stretching from Trenton to Middlesex County in New Jersey, from Greenwich to New Haven in Connecticut, and including western Suffolk as well as Rockland and northern Westchester counties, attracted another 11 percent.

Comparing the destinations of the out-commuters with the origins of the in-commuters, it becomes ap-

parent that the in-commuters generally journeyed farther. The Adjacent Ring was the home of 79 percent of the in-commuters, while 18 percent of them came from the Intermediate Ring. Of those in-commuters who were not destined for the Manhattan Central Business District about 50,000 were attracted to Manhattan outside the CBD, an equal number to Brooklyn and slightly more to Queens; the Bronx attracted about half as many.

For the sake of reference, Tables 46 and 47 break down the streams of in-commuters and out-commuters in detail by county, instead of aggregating them by Ring of Development, as Table 45 does. The intensive nature of interchange between adjacent counties--such as Queens and Nassau--becomes apparent. It is also apparent that major employment areas in New Jersey--such as Hudson, Essex, and southern Passaic counties--send relatively few commuters to New York City, compared to Nassau, Westchester or Bergen, but receive few reverse commuters as well. These areas are traditionally rather self-contained and the outbound commuter flow is disproportionately directed toward counties in New York State, even though the density of opportunities there is substantially lower.

Census data, as tabulated by Regional Plan Association, classify workers by place of residence and by place of work into three income groups: under \$5,000 annually, \$5,000 to \$10,000 annually, and over \$10,000 annually. The under \$5,000 group does not represent truly low-income workers: in 1960, \$5,000 was slightly above the median income in the Region, and in 1970 terms, due to inflation, would represent

Table 45.
Journey-to-Work Between New York City Boroughs and Surrounding Rings of the Region, 1960 (figures in 000's).

Workers Living In:	Work in:							Total NYC in commuters
	Manhattan CBD	Rest of Manhattan	Brooklyn	Queens	Bronx	Richmond		
Manhattan CBD	264.8	243.9	3.7	2.7	0.1	0.0		255.7
Rest of Manhattan	535.2	321.4	16.8	14.3	13.4	0.5		518.5
Brooklyn	1,043.8	358.2	595.2	44.4	6.8	1.2		1,012.9
Queens	786.0	335.3	71.6	306.3	11.6	0.3		736.2
Bronx	583.9	225.5	14.0	17.0	236.3	0.2		551.1
Richmond	80.7	25.6	3.3	0.6	0.2	45.2		75.5
Total from NYC	3,294.5	1,509.9	704.6	385.3	268.1	47.4		3,149.9
Adjacent Ring*	2,035.7	271.6	39.6	50.4	19.1	1.4		425.0
Intermediate Ring	1,351.8	66.3	8.2	11.0	2.7	0.7		96.1
Outer Ring	397.0	5.0	1.2	0.9	0.6	0.0		8.4
Out of Region	(57.0)	3.9	0.5	0.5	0.1	0.0		5.4
Total from outside NYC	3,784.4	346.9	49.4	62.8	22.5	2.2		534.8
TOTAL	7,079.0	1,856.8	754.0	448.1	290.6	49.6		3,684.8

*Nassau, Westchester, South Bergen, Passaic, South Newark, Essex, West Union, Hudson counties -- not shown

Source: Regional Plan Association, based on 1960 Census

\$6,590. Nevertheless, comparisons between these groups are useful for pointing out differences in travel behavior which are due to income. In the subsequent discussion, we shall refer to the three groups as the lower-, the middle-, and the upper-income groups.

Table 48 shows the distribution of these groups among different categories of workers in the Region. It is evident that in 1960, 58.5 percent of all workers in the Region were in the lower; 33.6 in the middle; and 7.8 percent in the upper-income group. Among New York City residents as a whole, the lower group was over-represented, while the middle and upper groups were under-represented. However, there was a stark difference between the Borough of Manhattan and the rest of the City. In Manhattan, the lower group accounted for 70 percent of all resident workers, the upper group was slightly over-represented with 8.5 percent, and the middle-income group accounted for only a fifth of the resident workers. In the rest of the City, the middle-income group held, proportionately, the same place as in the Region as a whole, while the lower-income group was slightly over-represented at the expense of the upper group. Thus, only Manhattan was a place of the rich and the poor; the rest of the City was middle-income, with a somewhat above-average proportion of people with lower incomes.

The reverse commuters out of the City were disproportionately concentrated in the middle-income group: over 40 percent of them were in this group, compared to 30 percent of all City residents. The lower-income group accounted for a correspondingly smaller share of the out-commuters. Thus, on the

whole, out-commuters were more affluent than the average City resident, and, in fact, more affluent than suburban residents who worked in the suburbs.

Inbound commuters to New York City were, of course, more affluent still. Well over one-quarter of them were in the upper income group, and slightly less than half in the middle income group. Thus, the proportion of higher income workers was about five times higher than in the City, and the proportion of middle-income workers, about one and one-half times higher.

Among both outbound and inbound commuters, sharp differences in income can be detected if one looks at their destinations or origins by Ring of Development in the Region, as shown in the bottom half of Table 48. Most of the lower income reverse commuters travel to relatively nearby places in the Adjacent Ring of counties; as distance increases, their proportion drops sharply and consistently. For trips to the Outer Ring (some 60 miles away) or out of the Region (over 80 miles away) only the middle- and high-income groups remain. The pattern among the inbound commuters is less pronounced. Nevertheless, a general tendency for higher-income workers to travel longer distances is apparent from the data in Table 48.

To see what this means for the location of job opportunities for lower-income areas of New York City, the trips to work for the lower-income group alone are tabulated for three major parts of the City shown in Table 49. In 1960, these three parts—Harlem, Central Brooklyn, and South Bronx (as defined for purposes of the table)—accounted for almost 30 percent of the City's resident workers with incomes of less than \$5,000 annually. It should be pointed out that for areas smaller than a borough in New York City, the 1960 Census lists workers only by place of residence. Thus, the destinations of workers from these four areas are not directly derived from the Census, but are estimated by a mathematical distribution model: given estimated job locations by small area; travel speeds on a schematic transportation network; and the assumption that the willingness of workers (by income group) to spend time travelling is uniform throughout the Region. These assumptions, while realistic on the whole, may not always be accurate in detail. For example, the speed of outbound trips may be faster than that of inbound trips on the same network, because there is less congestion in the reverse direction. Thus, the proportion of reverse commuters to outside New York City is somewhat understated in Table 49. Also, particular pairs of place of residence and place of work may have interchanges

Adjacent Ring*	Intermediate Ring	Outer Ring	Out of Region	Total to Outside NYC	Out-commuters
5.1	2.7	0.4	0.9	9.1	
16.0	0.5	0.1	0.1	16.7	
26.8	3.0	0.5	0.7	31.0	
44.4	4.6	0.3	0.6	49.9	
28.5	3.7	0.4	0.3	32.9	
3.8	1.3	0.0	0.1	5.2	
124.6	15.8	1.7	2.7	144.8	
ns.	ns.	ns.	ns.	ns.	
ns.	ns.	ns.	ns.	ns.	
ns.	ns.	ns.	ns.	ns.	
ns.	ns.	ns.	ns.	ns.	
ns.	ns.	ns.	ns.	ns.	
1,813.9	1,210.5	337.4	ns.	3,401.9	

Table 46.
Commuters to New York City Boroughs from Counties in the Region.

From: Place of Residence	To: Place of Work					
	Manhattan	Brooklyn	Queens	Bronx	Staten Island	NYC-Total
Manhattan	722,610	20,550	17,010	13,520	470	774,160
Brooklyn	365,320	595,180	44,370	6,760	1,240	1,012,870
Queens	346,660	71,580	306,330	11,330	330	736,230
Bronx	203,640	13,980	16,970	236,290	210	551,090
Staten Island	26,330	3,290	590	170	45,160	75,540
NYC Total	1,744,560	704,580	385,270	268,070	47,410	3,149,890
Hudson	35,840	2,110	1,420	520	290	40,180
Newark	3,000	460	120	90	170	4,640
Nassau	113,730	30,110	43,880	3,700	80	191,500
Westchester						
South	66,030	1,990	2,280	12,180	30	82,510
Bergen	61,780	3,150	1,570	2,310	120	68,930
Passaic						
South	5,230	330	300	130	0	5,990
Essex West	15,050	710	440	110	50	16,360
Union	13,080	700	360	80	680	14,900
Adjacent Ring	314,540	39,560	50,370	19,120	1,420	425,010
Suffolk West	19,020 ^a	5,600 ^a	9,450 ^a	670 ^a	20	34,860
Westchester						
North	8,430	270	190	800	10	9,700
Rockland	6,080	300	250	760	20	7,410
Passaic						
North	2,360	180	110	40	0	2,690
Morris	6,340	310	150	70	40	6,910
Somerset	1,900	150	70	10	20	2,150
Middlesex	6,370	540	270	110	410	7,700
Mercer	1,070	110	20	10	0	1,210
Monmouth	5,940	390	180	50	140	6,700
Fairfield						
South	16,930	380	340	190	20	17,860
New Haven	660	50	60	10	10	790
Intermediate Ring	73,520	8,180	10,990	2,690	690	96,170
Suffolk East	100 ^a	470 ^a	490 ^a	110 ^a	0	1,070
Putnam	1,030	70	20	140	0	1,260
Dutchess	520	60	50	70	0	700
Orange	930	150	80	70	0	1,230
Ulster	250	60	40	60	0	430
Sullivan	100	30	20	0	0	150
Sussex	300	10	30	10	0	350
Warren	100	30	30	0	10	170
Hunterdon	530	40	10	0	0	580
Ocean	790	170	100	60	20	1,160
Fairfield						
North	760	60	60	40	0	940
Litchfield	190	10	10	10	0	220
Outer Ring	5,620	1,180	940	590	30	8,260
Out of Region	4,270	470	490	140	20	5,390
Total	2,142,510	753,970	448,060	290,610	49,570	3,684,720

^aSuffolk split by simulation

Source: Regional Plan Association, based on 1960 Census

Table 47.
Commuters from New York City Boroughs to Counties in the Region.

To: Place of Work	From: Place of Residence					
	Manhattan	Brooklyn	Queens	Bronx	Staten Island	NYC-Total
Manhattan	722,610	365,320	346,660	283,640	26,330	1,744,560
Brooklyn	20,550	595,180	71,580	13,980	3,290	704,580
Queens	17,010	44,370	306,330	16,970	590	385,270
Bronx	13,520	6,760	11,330	236,290	170	268,070
Staten Island	470	1,240	330	210	45,160	47,410
NYC Total	774,160	1,012,870	736,230	551,090	75,540	3,149,890
Hudson	4,360	5,700	2,830	2,650	1,640	17,180
Newark	1,450	1,620	900	790	460	5,220
Nassau	3,680	12,640	34,790	3,100	80	54,290
Westchester						
South	4,430	1,890	2,610	16,860	40	25,830
Bergen	4,810	2,890	2,050	3,800	310	13,860
Passaic						
South	1,060	780	480	810	30	3,160
Essex West	620	460	370	250	230	1,930
Union	670	770	380	270	1,020	3,110
Adjacent Ring	21,080	26,750	44,410	28,530	3,810	124,580
Suffolk West	510	1,750	3,110	420	30	5,820
Westchester						
North	860	100	350	1,430	20	2,760
Rockland	420	110	140	360	20	1,050
Passaic						
North	0	0	20	0	10	30
Morris	190	120	70	120	70	570
Somerset	70	40	50	30	30	220
Middlesex	350	330	190	180	990	2,040
Mercer	120	80	50	20	20	290
Monmouth	120	70	60	70	50	370
Fairfield						
South	540	380	490	860	10	2,280
New Haven	70	30	50	170	0	320
Intermediate Ring	3,250	3,010	4,580	3,660	1,250	15,750
Suffolk East	0	0	0	0	0	0
Putnam	20	30	0	20	0	70
Dutchess	80	70	70	70	0	290
Orange	100	110	50	80	0	340
Ulster	0	0	0	0	0	0
Sullivan	190	140	40	130	0	500
Sussex	20	20	10	0	0	50
Warren	10	10	0	0	0	20
Hunterdon	0	0	0	10	0	10
Ocean	70	100	90	80	10	350
Fairfield						
North	40	10	10	20	0	80
Litchfield	10	10	0	0	0	20
Outer Ring	540	500	270	410	10	1,730
Out of Region	960	730	600	340	80	2,710
Total	799,990	1,043,860	786,090	584,030	80,690	3,294,660

Source: Regional Plan Association, based on 1960 Census

between them that are greater than expected on the average, because of particular ethnic or other social affinities. Nevertheless, the overall magnitudes, as estimated by means of the trip distribution model, represent a reasonable approximation of reality. The

travel patterns shown in Table 49 are graphically portrayed earlier, in Map 2.

In line with the fact that less than 5 percent of New York City's residents worked outside the City, and that those who did were disproportionately concen-

Table 48.

Income Distribution of Workers by Place of Residence and Place of Work, 1960.

	Number of Workers				Income Distribution %				Percent of Each Income Group			
	Total	Under \$5,000	\$5,000-10,000	Over \$10,000	Total	Under \$5,000	\$5,000-10,000	Over \$10,000	Total	Under \$5,000	\$5,000-10,000	Over \$10,000
Manhattan Residents	800.0	563.1	170.1	66.0	100.0	70.4	21.1	8.4	11.3	13.0	7.2	12.3
Rest of NYC Residents	2,494.5	1,539.5	831.7	123.4	100.0	61.7	33.3	4.9	35.2	37.1	35.1	22.4
Total NYC Residents	3,294.5	2,102.6	1,001.8	190.2	100.0	63.8	30.4	5.8	46.6	50.7	42.3	34.7
— Out-commuters	144.8	70.3	65.1	9.1	100.0	48.5	44.0	6.5	2.0	1.7	2.7	1.7
— Live and Work In NYC	3,149.9	2,032.3	936.8	180.8	100.0	64.5	29.7	5.7	44.4	48.8	39.3	32.6
+ In-commuters	534.8	131.7	244.5	158.6	100.0	24.6	45.7	29.7	7.5	3.2	10.3	20.6
— Total Working In NYC	3,684.7	2,164.0	1,181.3	339.4	100.0	50.7	32.1	9.2	52.0	52.1	49.6	51.1
Total Working In Manhattan	2,142.5	1,221.6	667.8	253.2	100.0	57.0	31.2	11.8	30.2	28.4	20.1	45.0
NYC Out-commuters												
to Adjacent Ring	124.6	61.0	56.1	7.5	100.0	48.9	45.1	6.0	1.3	1.8	1.5	2.4
to Intermediate Ring	15.8	7.2	7.3	1.3	100.0	45.6	46.2	8.0	0.3	0.2	0.2	0.3
to Outer Ring	1.7	1.0	0.0	0.1	100.0	59.5	33.5	6.9
Out of Region	2.7	1.1	1.1	0.0	100.0	39.5	39.5	21.0	.	.	.	0.1
NYC In-commuters												
from Adjacent Ring	425.0	110.2	102.8	122.0	100.0	25.9	45.4	28.7	5.0	2.7	6.1	22.0
from Intermediate Ring	96.2	17.5	45.6	33.0	100.0	18.2	47.4	34.3	1.4	0.4	1.9	5.9
from Outer Ring	8.3	2.2	3.9	2.2	100.0	27.0	46.7	26.3	0.1	0.1	0.2	0.4
from Out of Region	5.4	1.8	2.2	1.4	100.0	32.7	41.3	26.0	0.1	.	0.1	0.3
Live and Work Out of NYC	3,262.3	1,921.4	1,134.3	206.5	100.0	50.0	34.8	6.3	46.0	46.2	47.6	37.2
Region Total	7,091.8	4,155.7	2,300.7	555.3	100.0	59.5	33.6	7.0	100.0	100.0	100.0	100.0

* Less than 0.05 percent.

Source: Regional Plan Association, based on 1960 Census.

trated in the middle-income group, Table 49 shows that only about 2 percent of the lower-income residents in the low-income areas listed travelled to work outside the City. As suggested above, the figures may be understated by 1 percentage point or so, but this in no way changes the overall conclusion that the places of work for the three low-income areas were almost exclusively in New York City.

The major place of employment for Harlem was the Manhattan Central Business District, which accounted for 66 percent of all trips to work from Harlem. Another 23 percent of lower-income Harlem residents worked either in Harlem itself or in neighboring parts of upper Manhattan. Major industrial concentrations outside Manhattan--namely the Brooklyn waterfront, Long Island City, and the Southern Bronx--each accounted for about 3 percent of the Harlem lower-income trips to work.

The poverty areas of Central Brooklyn provided nearly 40 percent of the employment opportunities for their own lower-income residents. Another 29 percent worked in the Manhattan Central Business District, and 22 percent worked in the industrial areas along the Brooklyn waterfront. Long Island City attracted 2 percent and the remainder of Queens--at highly dispersed locations--another 3 percent.

Table 49.

Estimated Trips to Work From Selected NYC Low-Income Areas To Key Destinations in the Region, 1960.

Working In:	Workers Earning Under \$5,000		
	Living In:		
	Harlem	Central Brooklyn	South Bronx
Manhattan CBD	78,930 (66.2%)	73,380 (29.2%)	93,620 (38.5%)
Harlem	16,530 (13.9%)	1,290	17,080 (7.0%)
Rest of Manhattan	10,330 (8.7%)	1,330	12,850 (5.0%)
Inner Brooklyn	3,270 (2.7%)	54,910 (22.3%)	4,430 (1.8%)
Central Brooklyn	280	98,030 (39.4%)	810
Rest of Brooklyn	0	3,130	280
Long Island City	3,170 (2.6%)	5,190 (2.0%)	4,010 (1.6%)
Rest of Queens	70	7,200 (2.8%)	2,000
South Bronx	3,960 (3.3%)	690	99,500 (40.9%)
Rest of Bronx	160	400	3,570 (1.7%)
Staten Island	10	40	60
NYC Total	116,690 (97.9%)	247,390 (98.6%)	238,890 (98.2%)
Nassau-Suffolk Indust.	420	1,050 (0.4%)	290
Westchester Co.	410	280	1,160 (0.5%)
Rest of N.Y. State	560	900	520
NYS Excl. NYC	1,390	2,290	1,970
Hudson Co.	530	490	670
Newark	90	200	170
Bergen Indust.	180	220	710
Passaic Indust.	100	40	120
Essex Indust.	50	20	70
Union Indust.	30	20	40
Rest of N.J.	80	80	290
N.J. Total	1,060	1,070	2,070
Connecticut	40	20	140
Total Estimated	119,180	250,770	243,070
Total Actual	117,015	246,448	232,660

Source: Regional Plan Association.

For the poverty areas of Southern Bronx, just as for those of Central Brooklyn, the largest chunk of low-income employment was provided locally--about 41 percent. The next most important destination was the Manhattan Central Business District, with about 39 percent. Harlem and the rest of upper Manhattan were also important, with a total of 12 percent. The industrial areas of Long Island City and the Brooklyn waterfront each attracted slightly under 2 percent.

As evident from Table 49, improved access to the Manhattan CBD from upper Manhattan, Bronx and Brooklyn would help not just middle-income workers, but also about 40 percent of the low-income workers in the poverty areas listed. Almost half (46 percent) of the low-income workers would benefit from improvements of service either within the poverty areas themselves, or in their immediate vicinity; the most important journey-to-work stream in the latter category is that between the low-income areas of Central Brooklyn and the industrial areas along the Brooklyn waterfront, as well as Downtown Brooklyn, involving some 56,000 low-income workers. Access to Long Island City is less important, but would benefit about 13,000 workers from the three low-income areas. As for reverse commuting to the suburbs, the table shows only two concentrated streams that exceed 1,000 workers: from the southern Bronx to southern Westchester County; and from Central Brooklyn to the industrial spine of Nassau County.

Travel characteristics

The preceding discussion revealed the general tendency of higher income workers to travel longer distances to work. One way to explain this is simply to point to the spatial structure of the Region, in which 46 percent of all high-income workers work in the Borough of Manhattan, where only 12 percent of them live, while 65 percent live outside New York City. By contrast, low-income residential areas are either in close proximity to low-income employment areas, such as in the case of Central Brooklyn; or even coincident with them, such as in the case of the southern Bronx. However, a more general explanation is that the ability to move around--in pursuit of a job, a residential location, or other opportunities--is a commodity that is both costly and very income-elastic: the higher a person's income, the more of it he tends to buy.

Table 50 summarizes the differences in average time, average distance and average speed by income

group for two distinct classes of trips to work: those to the Manhattan Central Business District, and those to all other destinations elsewhere in the Region. The characteristics of trips to work in New York City outside the Central Business District are not separately shown in this table, because the 1960 Census did not allocate trip destinations within New York City to any finer detail than that of boroughs and the figures would be only estimates produced by mathematical simulation. In any case, the major difference in trip characteristics in the Region, is that between trips to the Central Business District and all other trips.

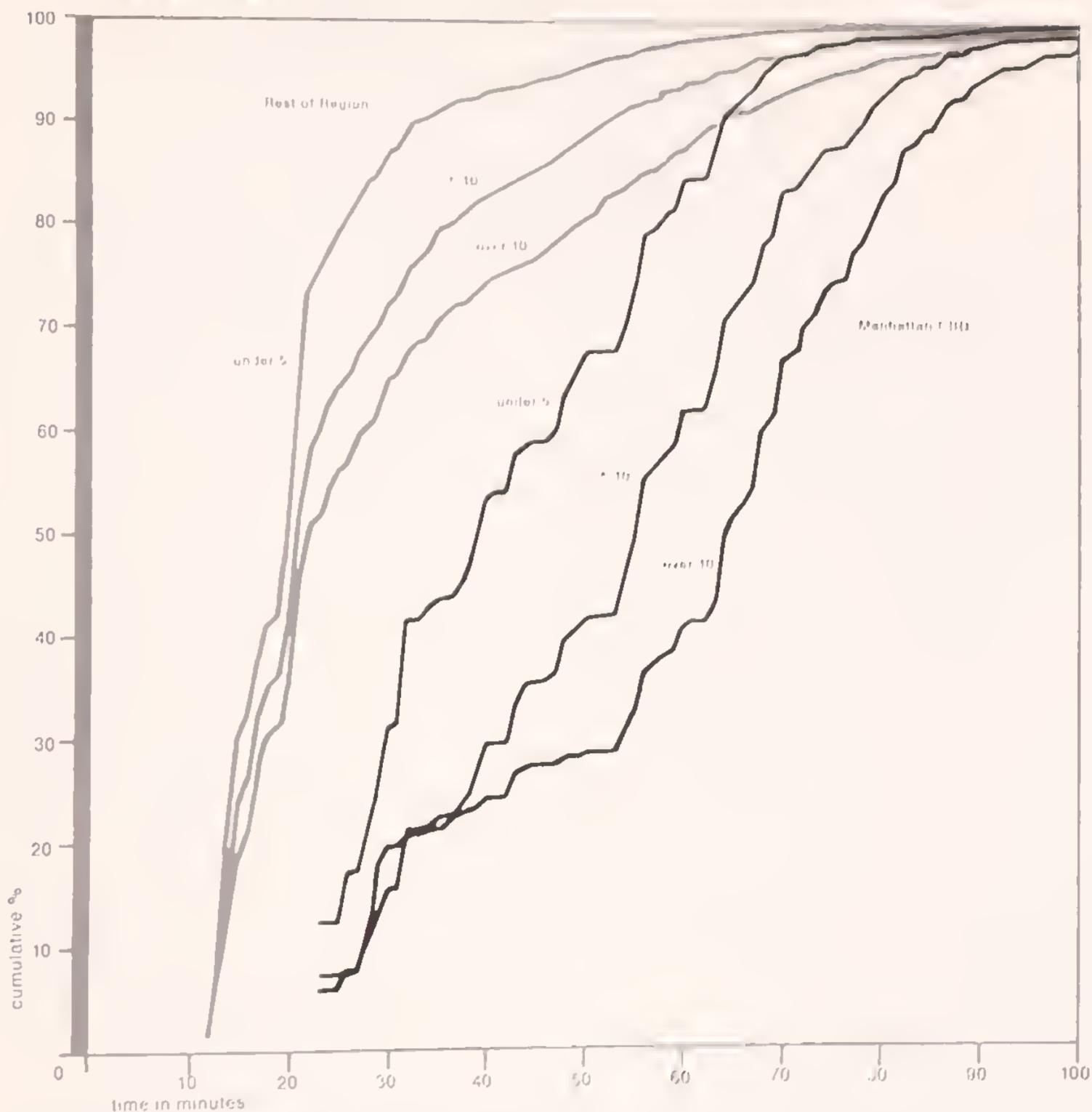
It is evident that as income rises, both the distance and the time consumed by the journey-to-work rise. However, distance increases in relation to higher income at a faster rate than does time, indicating that higher-income workers can purchase a higher speed, and also reflecting the fact that longer-distance trips are generally made at a higher speed than shorter ones. Whereas the average door-to-door travel time for lower-income workers travelling to the Manhattan CBD is 43 minutes at a speed of 9.3 mph, that of high-income workers is 61 minutes at a door-to-door speed of 15 mph. Similarly, for workers not working in the Manhattan CBD, the average time rises from 22 minutes at 11.3 mph in the lower-income group, to 32 minutes at 17.4 mph in the higher-income group. The longer average trip to Manhattan--9 miles, as compared to 5.5 miles for all other destinations--throws a disproportionately higher load on the transportation network: thus, while the Manhattan CBD employs 26 percent of the Region's workers, it generates

Table 50.
Average Times, Distances, Speeds and Person-Miles of Travel for Work Trips to the Manhattan CBD and to Rest of 31-County Region, by Income Group, 1960.

Annual Earnings of Workers	Average Time (minutes)	Average Distance (miles)	Average Speed (mph)	Work Trips (000's)	Person-Miles of Travel (000's)
Manhattan CBD:					
Under \$5,000	43	6.7	9.3	1,060	7,102
\$5,000-\$10,000	52	10.9	12.0	579	6,311
\$10,000 and over	61	15.2	15.0	218	3,313
Total	49	9.0	11.1	1,858	16,726
Rest of Region:					
Under \$5,000	22	4.2	11.3	3,093	12,990
\$5,000-\$10,000	28	7.0	15.1	1,799	12,593
\$10,000 and over	32	9.4	17.4	329	3,092
Total	25	5.5	13.3	5,221	28,675
Region Average:					
Under \$5,000	26.2	4.6	10.5	4,153	20,092
\$5,000-\$10,000	31.5	7.4	14.1	2,378	18,904
\$10,000 and over	41.7	12.4	17.8	547	6,405
Total	29.1	6.1	12.6	7,079	45,401

Source: Regional Plan Association.

Chart 8
Cumulative Percent Work Trips vs. Time by Income Group to the Manhattan CBD
and to the Rest of Region, 1960



Note: under \$5,000, \$5,000-10,000, over \$10,000 refers to income groups: workers earning under \$5,000, \$5,000 to 10,000, and over \$10,000 in 1960.

almost 37 percent of all person-miles of travel produced in travel to work in the Region.

While averages are a convenient summary measure, they give us no idea of how different trip-to-work times are actually distributed among the population. This is

best shown by a cumulative trip length frequency distribution, which charts the percent of trips for each small interval of time or distance. Chart 8 shows the cumulative travel time frequency distributions for each of the three income groups for both trips to the Manhattan CBD and to the rest of the Region.

The large gap between lower-income and middle- and high-income workers is readily apparent. While only about 5 percent of the low-income workers travel to work in the CBD more than 70 minutes, about 17 percent of the middle-income workers and about 33 percent of the high-income workers do. The median--the figure exceeded by half the workers--is, respectively, 39, 55 and 64 minutes for the three income groups. Only in the short range of trips is there a convergence--roughly 15 percent of all income groups travel less than 25 to 30 minutes to the CBD. The wiggleness of the lines reflects the incidence of residential areas for different income groups at varying distances from the Central Business District. Thus, both high- and low-income residential areas are to be found within 30 minutes; in the interval between 30 and 60 minutes of travel time, numerous low-income areas can be reached, some middle-income ones, but very few high-income areas. The latter are mostly located in the interval between 60 and 90 minutes of travel time.

The curves for non-CBD trips converge quite closely for all trips shorter than 20 minutes: if one takes all jobs in the Region together, there is a good chance that housing for each income group is, on the average, nearby; the median travel time for all income groups is somewhat in excess of 20 minutes. However, for trips over 20 minutes, the different travel propensities by income come into play: 90 percent of the low-income workers working outside the CBD do not travel more than about 35 minutes, according to the chart (subsequent data will suggest that this figure is understated for New York City); by contrast, the 90th percentile for middle-income workers is 52 minutes, and that for high-income workers outside the CBD--about 64 minutes.

Another way of demonstrating differences in travel behavior by income is by means of travel propensity curves. The various methods of analyzing travel generally agree that the number of trips between any two places is proportional to the number of trip ends (such as the number of resident workers) at one place, proportional to the number of opportunities (such as jobs) at the other place, and inversely proportional to the separation between the two places, which can be measured in terms of time, distance, cost, or a combination of these. However, the interaction between two equally attractive places does not decline in direct proportion to the separation between them, but at a generally faster rate, as separation increases. The rate at which greater separation becomes an impediment to travel is called travel propensity.

Chart 9 displays empirically determined travel propensity curves for the journey-to-work of each of the three income groups in the New York Region. It shows a dramatic decline in propensity to travel as travel time increases. Low-income workers are 100 times more likely to travel 24 minutes than to travel 61 minutes to work, assuming equal numbers of jobs at the employment end of the trip. It also shows that beyond about 24 minutes, the travel propensities of the different income groups diverge sharply. For example, the propensity of a high-income worker to travel 60 minutes is equal to 600 on Chart 9, almost 4 times higher than that of the low-income worker, who has a propensity of about 150. It is these sharply different propensities which, in combination with the geographic distribution of jobs and residences in the Region, produce the travel times shown in Table 50 and Chart 8. It can be noted parenthetically that compared to other metropolitan areas in the country, the propensity curves of the New York Region are flatter: in agreement with popular lore, New Yorkers are willing to endure longer trips to work than their counterparts in other cities.

Apart from the 1960 Census, the other major source of information on travel to work in the New York Urban Region is the 1963 Tri-State Regional Planning Commission Home Interview survey. Though based on a 1 percent sample of households (as opposed to a 25 percent sample of the Census) and covering only the continuously developed parts of the Region, it pertained to all weekday travel (not merely the journey-to-work) and, with respect to area-wide aggregates, provides very rich detail on travel behavior.

The Tri-State data demonstrate that the dependence of an individual's amount of travel on his income pertains not only to the length of the trips he makes, but also to the number of trips. Chart 10 shows how the percapita number of trips for all purposes increases with income; it also shows that in each income group, residents of New York City make fewer percapita trips than their counterparts in the suburbs. The latter phenomenon may be partially explained by the fact that pedestrian trips are not included in the survey and that short intra-city trips appear to be under-reported, but on the other hand, non-work suburban auto travel is under-reported as well. More generally, and especially for the higher-income categories, where the divergence is greatest, fewer percapita trips by City residents are due to the fact that higher urban density tends to suppress--or make unnecessary--the amount of travel that is pos-

sible--or necessary--in lower density suburban areas. In any case, Chart 10 shows that the daily number of trips made by mechanical means per person varies from about 1 for the \$0 to \$2,000 income category to some 3.2 for the over \$15,000 category in the Region outside New York City. In New York City, the variation shown is from about 0.9 trips per day for the lowest income group to about 2.2 for the highest income group.

The dependence of trip length on income is also demonstrated by the Tri-State data, as presented in Table 51. This table differs from Table 50 in that the data are listed by place of residence (which blurs the distinction between CBD oriented and non-CBD oriented trips); the income break focuses on truly low-income

workers more sharply; the difference between New York City and the rest of the Region is shown; and the dimension of automobile availability is added (although the Table does not suggest that trips of workers with available autos are necessarily made by auto). Also, the travel times represent responses by interviewees, the distances--airline distances--while in Table 50 both were measured over a schematic network.

Nevertheless, the results are quite similar: as income rises, the length of the journey-to-work increases, with the high income group travelling at least 1.5 times farther than the low income group; speed also rises with rising income, so that the contrasts between income groups in terms of travel time become less pronounced. These general relationships

Chart 9.
Propensity Curves for Work Trips in the New York Region by Income Group.

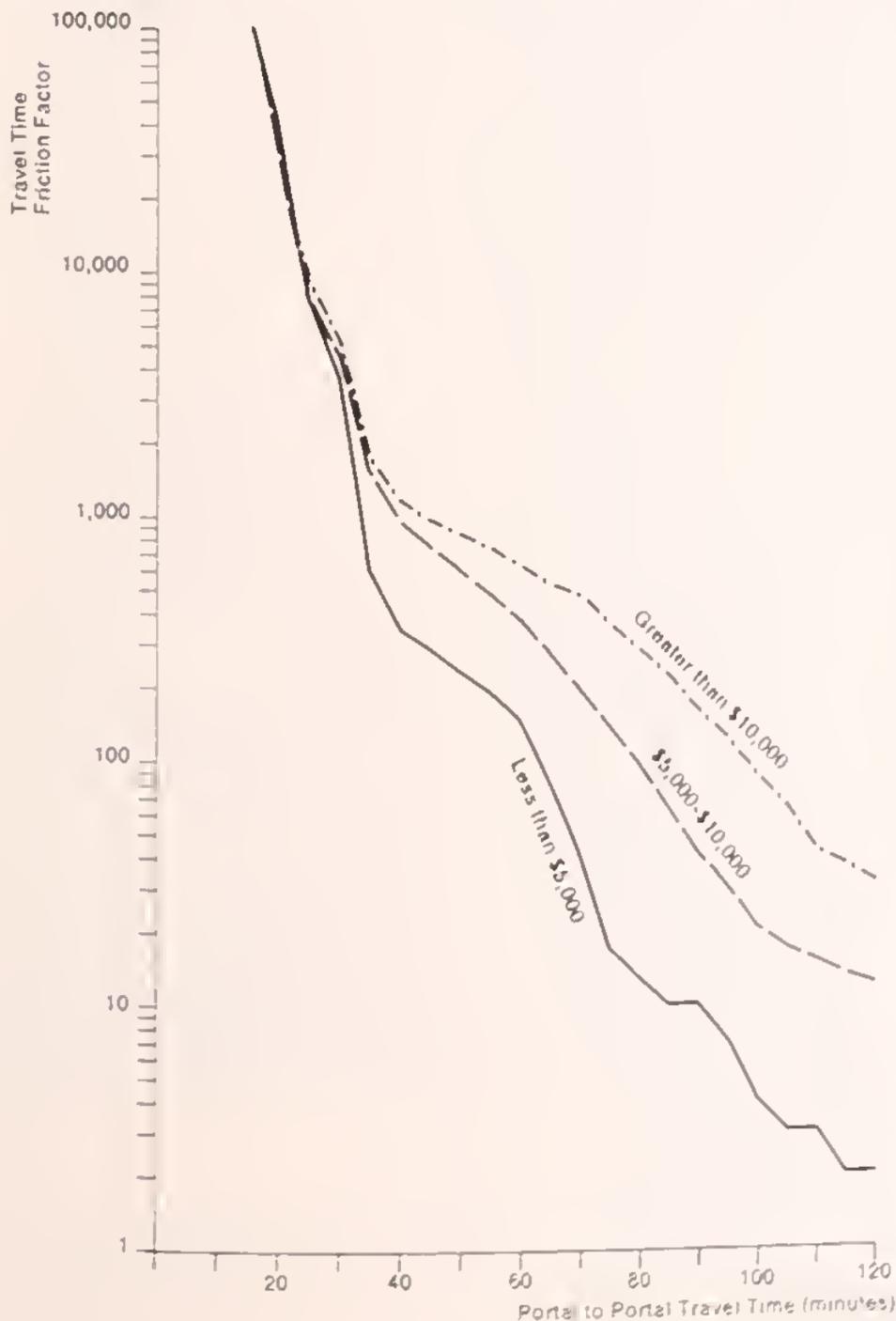
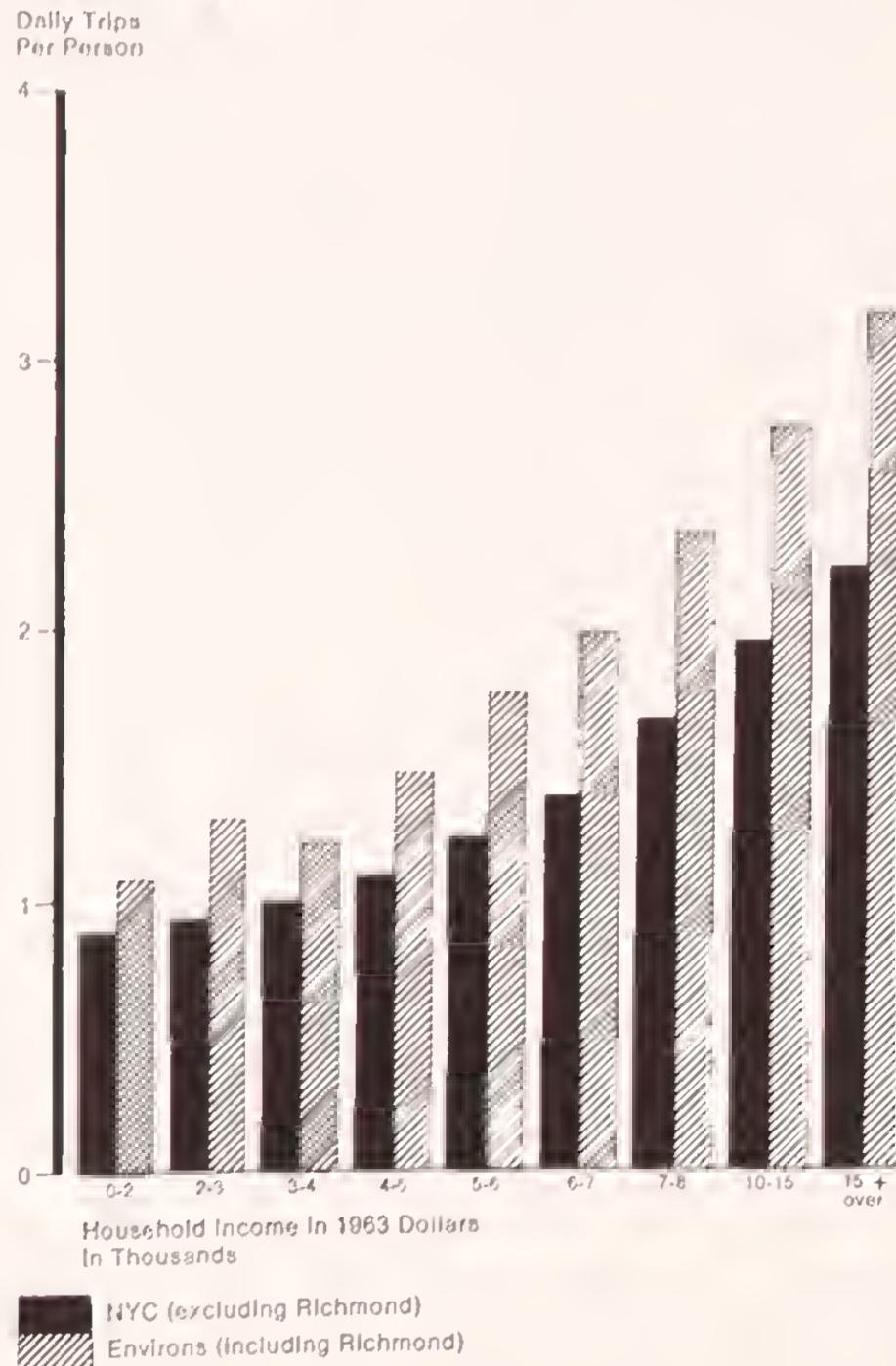


Chart 10
Daily Trips Per Person by Income Group in New York City and In Its Environs.



Source: TERPC

Table 51.
Average Times, Distances and Speeds for Work Trips from New York City and Outside New York City Residences by Income Group and Auto Availability, 1963.

	Average Time (minutes)	Average Airline Distance (miles)	Average Airline Speed (mph)
NYC Residents ^a without Autos			
\$0-\$4,000	29.0	2.9	6.0
\$4,000-\$10,000	35.0	4.0	6.9
\$10,000 and over	31.8	4.5	8.5
NYC Residents ^a with Autos:			
\$0-\$4,000	25.3	3.4	8.0
\$4,000-\$10,000	33.9	5.3	9.4
\$10,000 and over	36.2	6.1	10.1
Non-NYC Residents ^b without Autos			
\$0-\$4,000	18.5	1.9	6.1
\$4,000-\$10,000	25.6	4.1	9.6
\$10,000 and over	26.8	4.9	11.0
Non-NYC Residents ^b with Autos:			
\$0-\$4,000	15.6	2.9	11.1
\$4,000-\$10,000	27.6	6.8	14.8
\$10,000 and over	36.4	9.9	16.3

^aExcluding Richmond

^bIncluding Richmond

Source: Tri-State Regional Planning Commission

Table 52.
Automobile Availability by Income, 1963.

Income Group	Percent of Households in Each Income Group Having 1 or More Automobiles in 1963	
	New York City ^a	Region Outside New York City ^b
\$0-2,000	7%	31%
\$2,000-3,000	12	44
\$3,000-4,000	16	50
\$4,000-5,000	28	71
\$5,000-6,000	31	84
\$6,000-7,500	55	91
\$7,500-10,000	67	95
\$10,000-15,000	72	98
\$15,000 and over	73	99

^aExcluding Richmond

^bIncluding Richmond, but excluding peripheral counties

Source: Tri-State Regional Planning Commission

Table 53.
Carless Households as a Percent of Total Households in New York City and Selected Suburban Counties, 1966-1970.

County	Percent Carless Households	
	1960	1970
New York City:		
Bronx	60%	61%
Brooklyn	56	57
Manhattan	80	76
Queens	34	36
Richmond	25	19
Suburban Counties:		
Nassau	8%	8%
Suffolk	5	5
Westchester	18	17

Source: 1970, 1960 Census

hold true for both New York City and non-New York City residents. However, middle- and upper-income non-residents generally travel farther and faster than residents; this is especially true for those owning automobiles. For the low-income group, this relationship is reversed: low-income heads of households living in New York City travel farther to work than their suburban counterparts, both those who do not own automobiles and those who do. In the case of the non-auto owning low-income households in the City, their longer trip to work can be explained by their ability--or need--to use the City's extensive mass transit system; limited transit availability outside New York City confines the low-income workers' job locations there to within an average of 1.9 miles of their places of residence, compared to 2.9 miles in the City. In the case of auto owning low-income households, their longer average trip if they are residents of New York City can be attributed to reverse commuting, which is heavily dependent on the automobile. Other Tri-State data indicate that among heads of households in the under \$4,000 income group who have no autos available and live in New York City, only 3.4 percent travel to work outside the City. By contrast, close to 10 percent of those who do have an auto are reported to travel to work beyond the City limits.*

This brings us to the question of auto availability by income group. As is well known, automobile availability strongly influences both the total amount of travel, and the choice of mode, which we will discuss subsequently. Automobile ownership, in turn, is most strongly influenced by income, but also by the residential density at which a household lives. Higher residential density both reduces the need for an automobile, and inhibits the convenience with which it can be used. Table 52 shows, by income group, the percent of all households which had one or more automobiles available in New York City and in the Region outside New York City in 1963.

It is evident that in the two highest income brackets auto ownership rates in the City were about one-quarter lower than outside the City; since households with incomes above \$10,000 can presumably afford an automobile, this degree of abstention from auto ownership due to conditions peculiar to New York City can

* Harold Kassoff and Harold Deutchman, People, Jobs and Transportation. Tri-State Regional Planning Commission, June, 1968, p. 32

be interpreted as voluntary. However, among the middle- and lower-income groups, particularly those with incomes below \$6,000, the divergence is much greater, with the ownership rates outside the City up to three or four times higher than in the City. This can be interpreted positively, in the sense that at these income levels auto ownership is a financial hardship, necessary outside the City but avoidable in the City; nevertheless, as pointed out above, the sharply reduced auto ownership at lower-income levels in the City does inhibit the mobility of this segment of the population--mobility with regard to job choice as well as for other purposes.

Overall in 1960, 57.5 percent of New York City households had no automobiles, compared to 16.8 percent of the households in the Region outside New York City; only 4.2 percent of the City households had two

or more cars, compared to 25 percent outside the City. Over the 1960-1970 decade, the number of households with no cars available decreased only slightly in most City Boroughs. The following table reviews these auto ownership patterns for New York City and three suburban counties.

Even in Essex County, only 15 percent of all households had no car available in 1970, though in Newark proper, it is likely that auto ownership patterns were more comparable to those in New York City.

Choice of mode

As is well known, the New York Region, and particularly New York City, is more heavily dependent on public transportation than any other part of the nation. Table 54 indicates that in 1960, the Region accounted

Table 54.
Means of Transportation to Work in the Nation and the Region, 1960.

	No. by Rail, Subway %	No. by Bus %	No. by Other Means %	No. by Auto %	No. Walking %	No. at Home %	Total Workers %
Total	2,599,163	5,560,399	1,693,982	43,228,872	6,704,807	4,868,582	64,895,105
United States	4.02	8.60	2.62	66.84	10.37	7.53	100.00
Total	2,556,384	5,391,045	1,080,090	31,760,130	4,947,667	1,424,400	47,165,748
Urban U.S.	5.42	11.43	2.29	67.35	10.49	3.02	100.00
N.Y. Region (31 Counties)	1,942,851	938,450	139,161	3,119,153	729,006	224,220	7,092,841
Region	27.40*	13.23	1.96	43.98	10.28	3.16	100.01
As % of Total U.S.	74.75	16.88	8.22	7.22	10.87	4.61	10.97

*Rail 4.2% subway 23.2%

Note: Census classification "Not Reported" is allocated proportionally among the other modes.

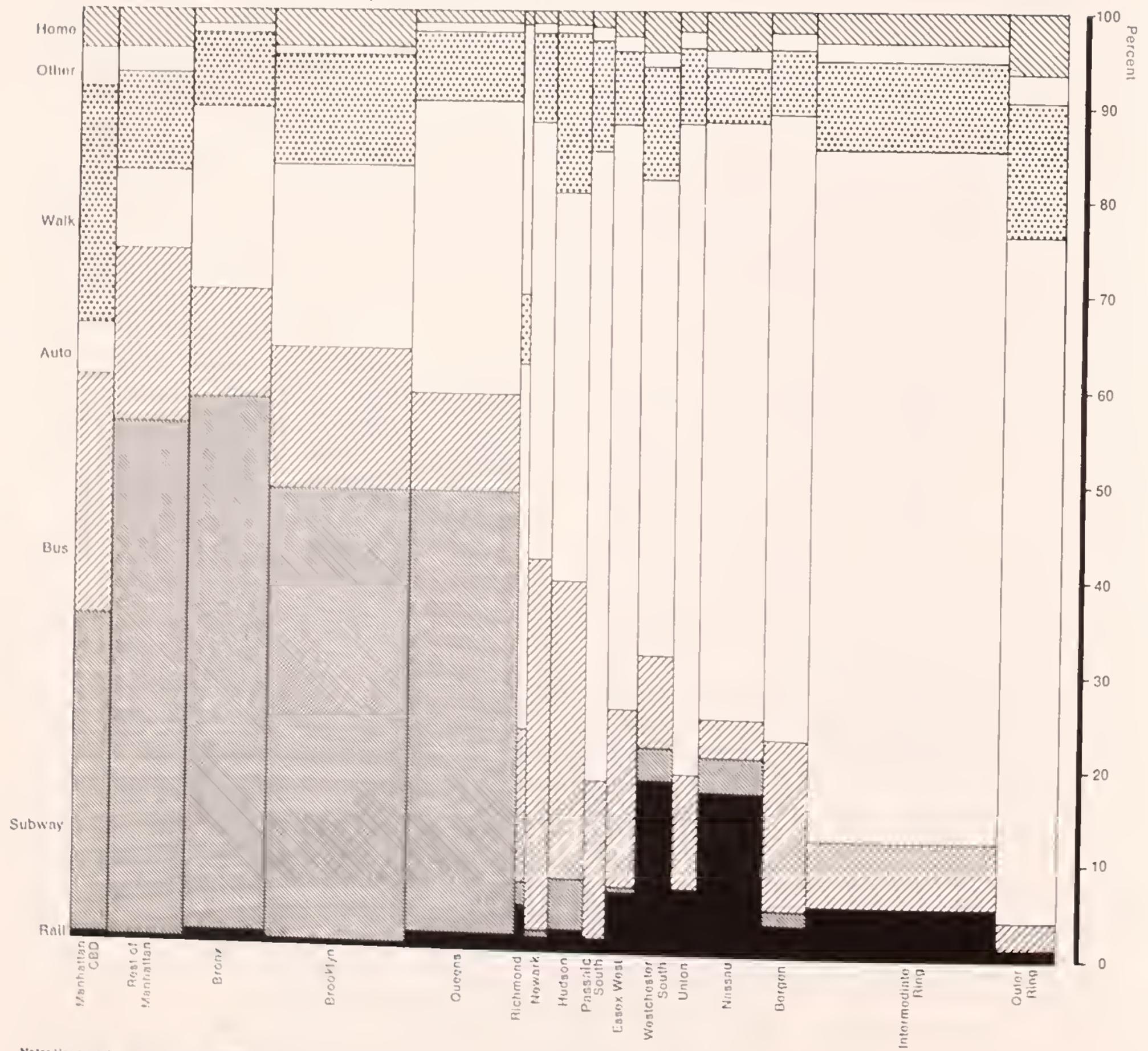
Source: U.S. Census of Population, 1960

Table 55.
Means of Transportation to Work in the Region by Place of Residence, 1960.

Place of Residence	Total Number of Workers by each Mode							Each Mode as Percent of Total							Total	
	Rail	Subway	Bus	Other	Auto	Walk	At Home	Total	% Rail	% Subway	% Bus	% Other	% Auto	% Walk		% At Home
Manhattan CBD	2.5	91.3	67.2	10.8	14.8	68.5	11.3	266.6	0.95	34.25	25.23	4.05	5.56	25.21	4.24	100.0
Rest of Manhattan	4.4	294.9	104.2	13.6	43.8	54.8	23.1	538.7	0.81	54.74	19.34	2.52	8.14	10.16	4.28	100.0
Brooklyn	8.6	504.0	157.4	8.9	201.5	124.2	41.5	1,046.0	0.82	48.18	15.04	0.85	19.26	11.88	3.96	100.0
Queens	13.9	372.6	83.4	7.4	244.6	55.7	11.3	789.0	1.76	47.22	10.59	0.94	31.00	7.06	1.43	100.0
Bronx	8.4	332.8	68.4	5.1	111.5	46.6	9.6	582.3	1.43	57.15	11.75	0.88	19.15	8.00	1.65	100.0
Richmond	3.9	1.9	13.1	23.0	31.7	6.0	1.5	81.0	4.81	2.36	16.11	28.44	39.09	7.39	1.80	100.0
NYC Total	41.7	1,597.4	493.7	68.8	647.9	355.8	98.2	3,303.5	1.21	48.36	14.94	2.08	19.61	10.77	2.97	100.0
Hudson	6.1	13.9	80.1	2.4	103.7	42.3	3.7	252.2	2.44	5.50	31.78	0.92	41.11	16.78	1.48	100.0
Newark	2.5	1.3	64.2	1.6	75.0	15.1	2.4	162.1	1.57	0.79	39.61	0.96	46.28	9.32	1.48	100.0
Nassau	80.1	17.3	19.4	8.3	292.9	27.6	18.6	464.2	17.26	3.73	4.17	1.79	63.11	5.94	4.01	100.0
Westchester Co.	48.4	9.1	25.8	4.5	131.7	31.4	10.8	261.6	18.48	3.47	9.85	1.72	50.34	12.02	4.12	100.0
Bergen	10.4	4.6	55.2	5.5	201.6	17.6	2.7	153.8	1.58	0.09	16.79	1.58	66.74	11.45	1.75	100.0
Passaic Co.	2.4	.1	25.8	2.4	102.6	17.6	6.0	216.1	5.75	0.44	19.74	1.49	62.01	7.79	2.78	100.0
Essex West Union	12.4	9	42.7	3.2	134.0	16.8	4.2	203.2	7.07	0.07	12.14	1.76	68.92	7.85	2.09	100.0
Adj. Ring Total	176.8	47.3	337.8	31.5	1,121.6	188.4	55.7	2,019.1	8.45	2.34	16.73	1.56	58.52	9.33	2.76	100.0
Interm. Ring	73.9	.9	94.6	26.2	985.1	125.4	43.1	1,349.2	5.48	0.07	7.01	1.94	73.01	9.30	3.19	100.0
Outer Ring	4.5	.3	12.3	12.7	304.5	59.4	27.2	421.0	1.08	0.01	2.93	3.01	72.33	14.10	6.48	100.0
Region Total	296.9	1,645.9	938.5	139.2	3,119.2	729.0	224.2	7,092.8	4.19	23.21	13.23	1.96	43.98	10.28	3.16	100.0

Source: U.S. Census of Population, 1960

Chart 11.
Choice of Mode for Work Trips by Place of Residence



Note: Horizontal scale—1 inch=1 mile on trips
see Table 55 for numerical values

for about 11 percent of all workers in the nation, but for almost 75 percent of those who travelled to work by subway or railroad, and for almost 17 percent of those who travelled to work by bus. The Region's share of those who travelled to work by auto was correspondingly lower, but the proportions of those walking to work or working at home were comparable to those in other metropolitan areas.

Despite this national prominence of the Region in the field of public transportation, within the Region, the automobile was, even in 1960, the single most important means of travel to work, accounting for almost 44 percent of all trips; rail and subway was the next most important mode, accounting for 27 percent of all work trips, followed by bus, which carried 13 percent, and by walking, which accounted for 10 percent. The remainder was distributed among "other" modes (including taxis and ferries) and those workers who did not make any trips, but worked at home.

The 1960 Census, on which these data are based, does not provide comprehensive detail on the choice of mode for all parts of the Region by place of work; partial data suggest that over three-quarters of all the rail and subway trips in the Region were destined to the Borough of Manhattan. However, full detail is available by place of residence, and is summarized in Table 55 and Chart 11. Overall, the choice of mode at the place of residence is primarily influenced by the destination of the trips: if a high proportion are destined to high-density places of employment, such as Manhattan or major sub-centers, the proportion of trips to work by railroad or subway is large; if the destinations are dispersed, the auto predominates. Secondly, the choice of mode is influenced by the residential density at the place of residence: this is particularly true for such shorter-distance public transportation modes as subway and bus. Table 55 and Chart 11 clearly show how subway and bus usage declines with declining residential density, as one moves further away from the center of the Region. Thirdly, modal choice is of course influenced by the availability of the different modes: thus, areas with superior rail service show greater rail usage, whereas areas with a less efficient rail system show greater dependence on the bus or the auto.

In line with this reasoning, close to one-fifth of the residents of Nassau and southern Westchester county travel to work by railroad; this proportion drops to 5 percent in the Intermediate Ring of counties, and to about 1 percent both in the Outer Ring, which has few commuters, as well as in Manhattan, from

whence only reverse commuters can travel by rail.

The Bronx shows the highest dependence on the subway, with 57 percent of its workers using this mode, and upper Manhattan, Queens and Brooklyn follow closely, with about half the workers travelling by subway, which is close to the New York City average. Outside the City, only the adjacent counties of Hudson, Nassau and southern Westchester show small but significant numbers of subway users.

Bus use is highest in the City of Newark (almost 40 percent), and also prominent in nearby areas of New Jersey, such as Hudson, western Essex, Bergen and southern Passaic counties, which lack an effective rail transit system but have residential densities sufficient to support bus service. In New York City, bus use for the journey-to-work is lower, averaging 15 percent City wide, with no major deviations by borough, except for the Manhattan Central Business District, where it is used for travel to work by 25 percent of the residents on short trips. In the Intermediate Ring of counties, which includes older cities from Trenton to New Haven, 7 percent of the workers travel by bus, but in the largely rural Outer Ring this proportion drops to 3 percent.

Automobile use for travel to work increases consistently as one moves from the center outward, from a low of 5 percent within the Manhattan Central Business District, to 19 percent in Brooklyn and the Bronx, to 31 and 39 percent in Queens and Staten Island respectively, to an average of 58 percent in the Adjacent Ring of counties, and more than 70 percent in the Intermediate and Outer Rings.

Walking to work is dependent on the proximity of places of work to residential areas of at least moderate density, and occurs in both large and small urban places: the proportion of walkers is highest among residents of the Manhattan Central Business District--25 percent--but is also above average in Hudson County, Brooklyn, southern Westchester and southern Passaic, as well as in the Outer Ring, with its numerous old rural towns. Among the areas shown, walking to work is least frequent in the new, spread, auto-oriented counties of Bergen and Nassau, where only about 6 percent of the workers walk to work.

The Census catchall category of "other" modes mostly displays taxi use in Manhattan and ferry use for trips from Staten Island, otherwise accounting for about 1 percent of all trips. The "work at home" category shows no notable pattern, except for somewhat higher occurrence in high-income areas and in the Outer Ring, where it includes farmers.

Of basic interest for the purposes of this study is how choice of mode varies by income. As the preceding discussion showed, individual sub-areas of the New York Region vary so much in terms of their commuter orientation, their residential density, and the availability of transportation systems, that it is useful, for purposes of analyzing the effect of income, to break out fairly homogeneous areas, which, within themselves, display similar characteristics. In the subsequent analysis, six such areas are used, as designated on the accompanying charts.

- A. The Borough of Manhattan.
- B. Bronx, Brooklyn, Queens, Hudson (mostly older high-density areas with subway service, strongly oriented toward Manhattan).
- C. Bergen, Passaic, Essex (close-in urban-suburban counties with dense bus service, fair to poor rail service).
- D. Morris, Middlesex, Monmouth, Union (farther-out suburban counties, moderately oriented toward the Core, with fair rail service).
- E. Nassau, Westchester, Fairfield, Suffolk (suburban counties with strong Core-orientation and good rail service).
- F. Mercer, New Haven, Dutchess (farther-out counties with sub-centers largely independent of the Region's Core).

For each of these areas, Charts 12 through 17 first show how the share of workers travelling by the various modes changes as income rises, with the percentages plotted cumulatively. Charts 18 through 23 show for each particular mode, how its use changes with income, with the six geographic areas compared on each chart. Finally, Charts 24 through 27 show, for each particular mode, how its use changes depending on auto ownership.

The charts, derived from unpublished 1960 Census data prepared by the Tesaro Company* are based on cross tabulations of household income and auto ownership, by county of residence, with mode of travel to work by the head of the household. The travel mode

of secondary wage-earners is not shown. Though the original tabulations include three household sizes (1-2, 3-4, 5 and over) only the data for the middle-sized 3-4 person household are shown here (the average household size in 1960 was 3.1 in the Region, 2.9 in New York City). Travel habits of heads of smaller or larger households are virtually identical, if income is corrected on a per capita, rather than household, basis.

In the form in which they were available, the data had some unfortunate gaps--for example, cross tabulations with auto ownership within New York City were not available. Also, a programming error placed some 70,000 non-family households of all incomes in New York City into the over \$25,000 income group, which causes some trends to be distorted (notably Charts 12 and 19 in the highest income range. Finally, the insufficient sample of high-income households in some smaller counties (Putnam, Rockland) and confused mode definitions on Staten Island led to their exclusion. Nevertheless, valuable insights can be derived from the series.

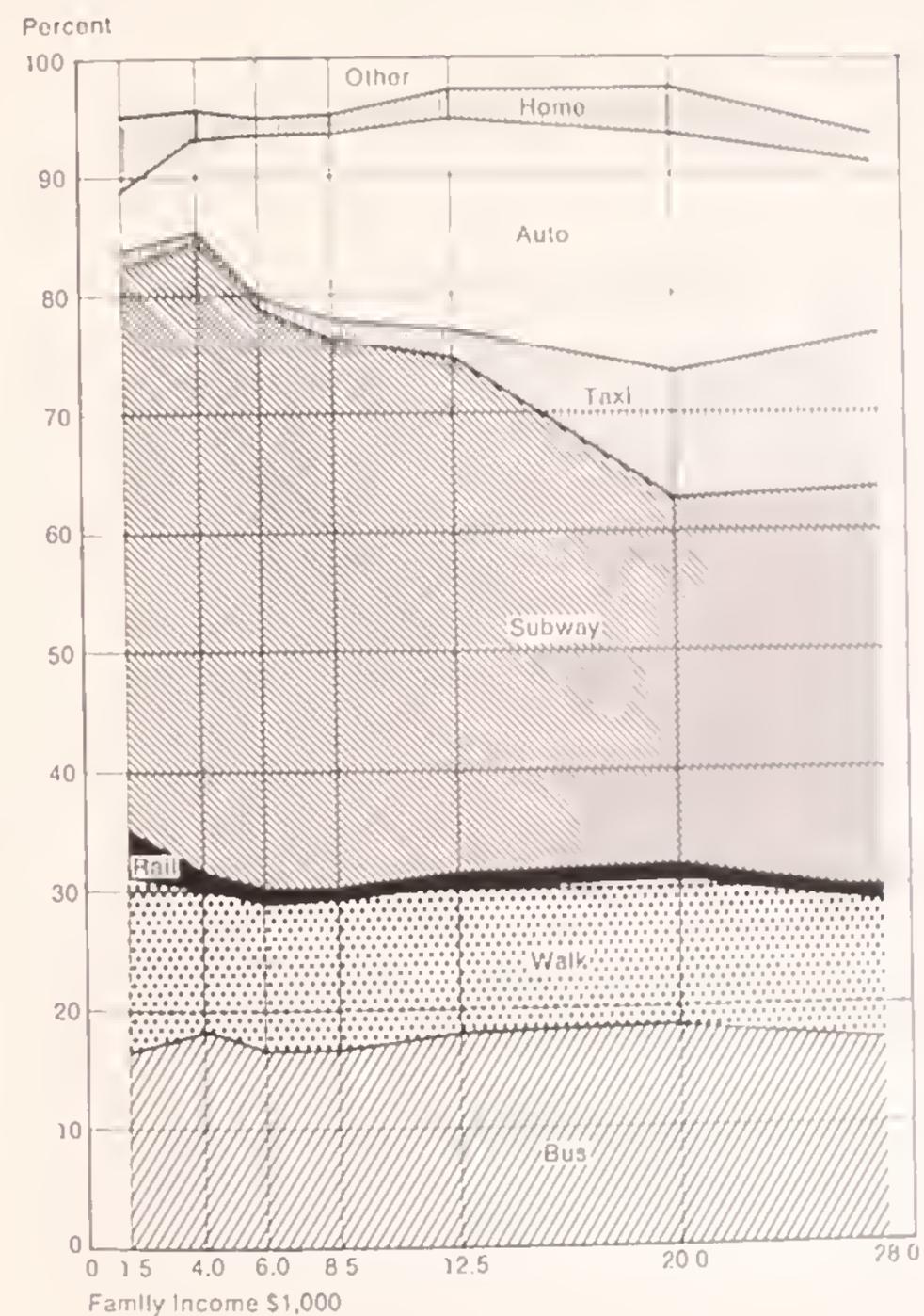
Railroad use is least frequent in the \$3,000 to \$5,000 income class, and increases dramatically with income in all suburban areas where rail travel is significant. In some of the suburban counties, almost 45 percent of the highest income group (over \$25,000) travel by rail. Interestingly enough, however, rail use also rises above the lower middle-income level at the lowest income level. In the \$0 to \$3,000 income group, about 2 percent travel by rail in the City, and about 9 percent in rail-oriented suburbs. Some of the rail use in the lowest income groups, also noticeable in Charts 12 and 13 is due to out-commutation by domestic service workers, whose fares are paid by the employer. Overall, however, rail emerges as unquestionably the high-income mode of travel, and as income rises, it displaces the auto in importance even in those sectors where total rail use is relatively small.

Aside from its pronounced increase with income, the use of rail for travel to work is independent of automobile ownership. As Chart 24 shows, it rises slightly as car ownership rises from 0 to 1, then drops slightly for higher ownership rates, but in the net about the same proportion of heads of no-car households, as heads of 3-car households, travel to work by rail.

Subway use is markedly different from railroad use. In areas with subway service, subway riding to work by heads of households declines moderately from a 45 percent level, as income rises from \$3,000 to

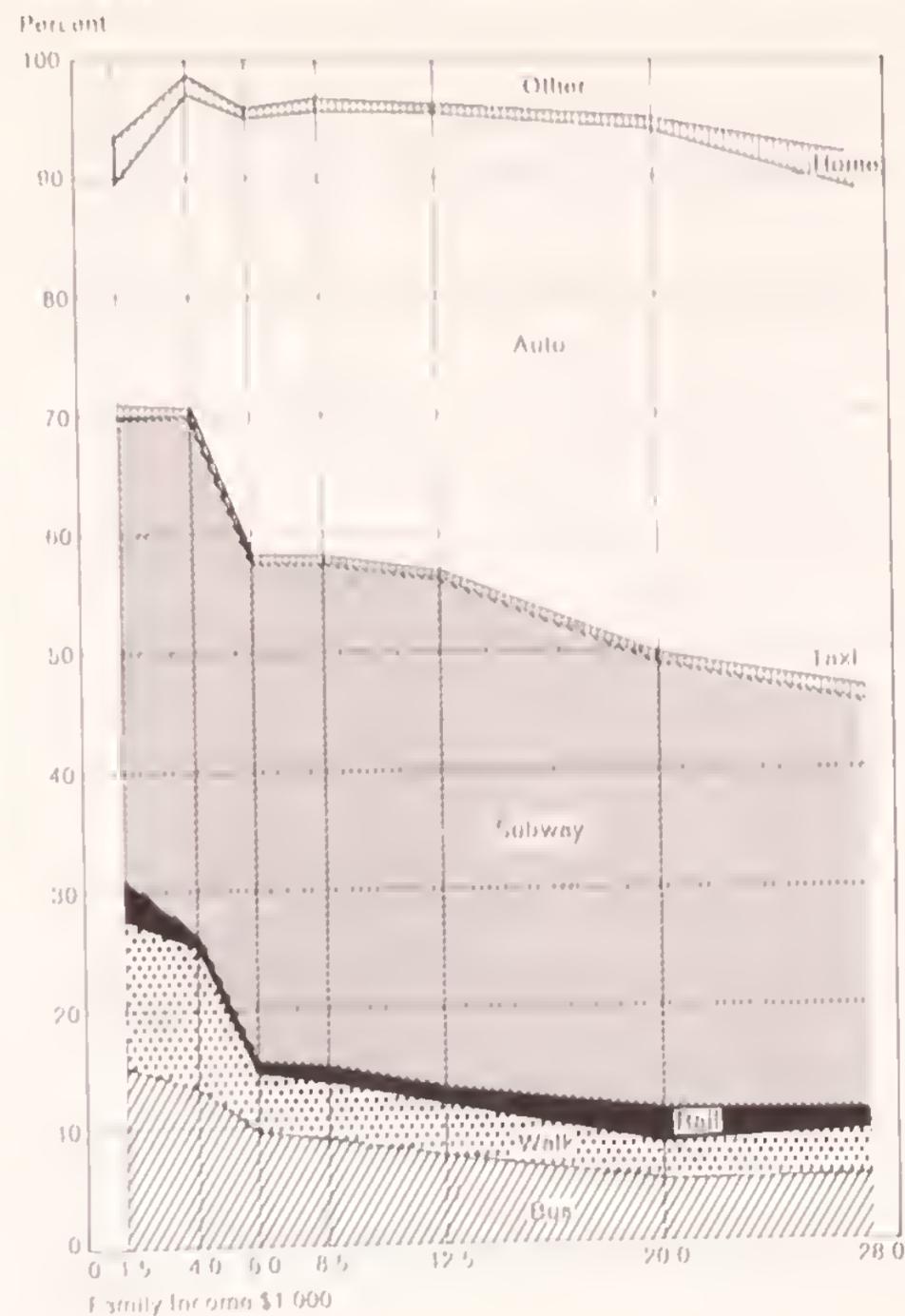
* People and Homes in the American Market. S. J. Tesaro & Co., 1961

Chart 12.
Choice of Mode by Income, Manhattan Residents.



\$15,000, and falls off more sharply in the two highest income brackets, in Manhattan more so than in the rest of the Core. As is shown in Chart 12, the diversion of the higher-income riders in Manhattan is mostly to autos and taxicabs, and begins quite early with the over \$5,000 group; taxicabs become an important mode for the over \$15,000 group, accounting for over 10 percent of its trips to work. In the other boroughs and Hudson County (Chart 13) taxicabs are unimportant; diversion from subway to auto is less pronounced, and is felt mostly in the over \$15,000 income group. The lowest income group, below \$3,000, also uses the subway less frequently than the \$3,000 to \$15,000 groups. The small number of out-of-city residents using the subway appears mostly in the upper middle-income brackets.

Chart 13.
Choice of Mode by Income, Bronx, Brooklyn, Queens, Hudson Residents.



As noted, cross tabulations with auto ownership were not available for New York City from the 1960 Census; data for Hudson County suggest that subway riding declines very mildly with increasing auto ownership. This conclusion is supported by Tri-State Regional Planning Commission data for New York City from the 1963 Home Interview survey. This source shows that in Manhattan, the proportion of auto-owning households (19 percent) is the same among subway riders and among the total population; in Brooklyn, 41 percent of the subway riders own autos vs. 42 percent of all households; in the Bronx, 39 percent of the subway riders own autos vs. 42 percent of all households, and in Queens, the relationship is 63 vs. 65 percent. Only on Staten Island is this relationship reversed, with more rapid transit riders owning cars than the

Chart 14.
Choice of Mode by Income, Bergen, Passaic, Essex Residents.

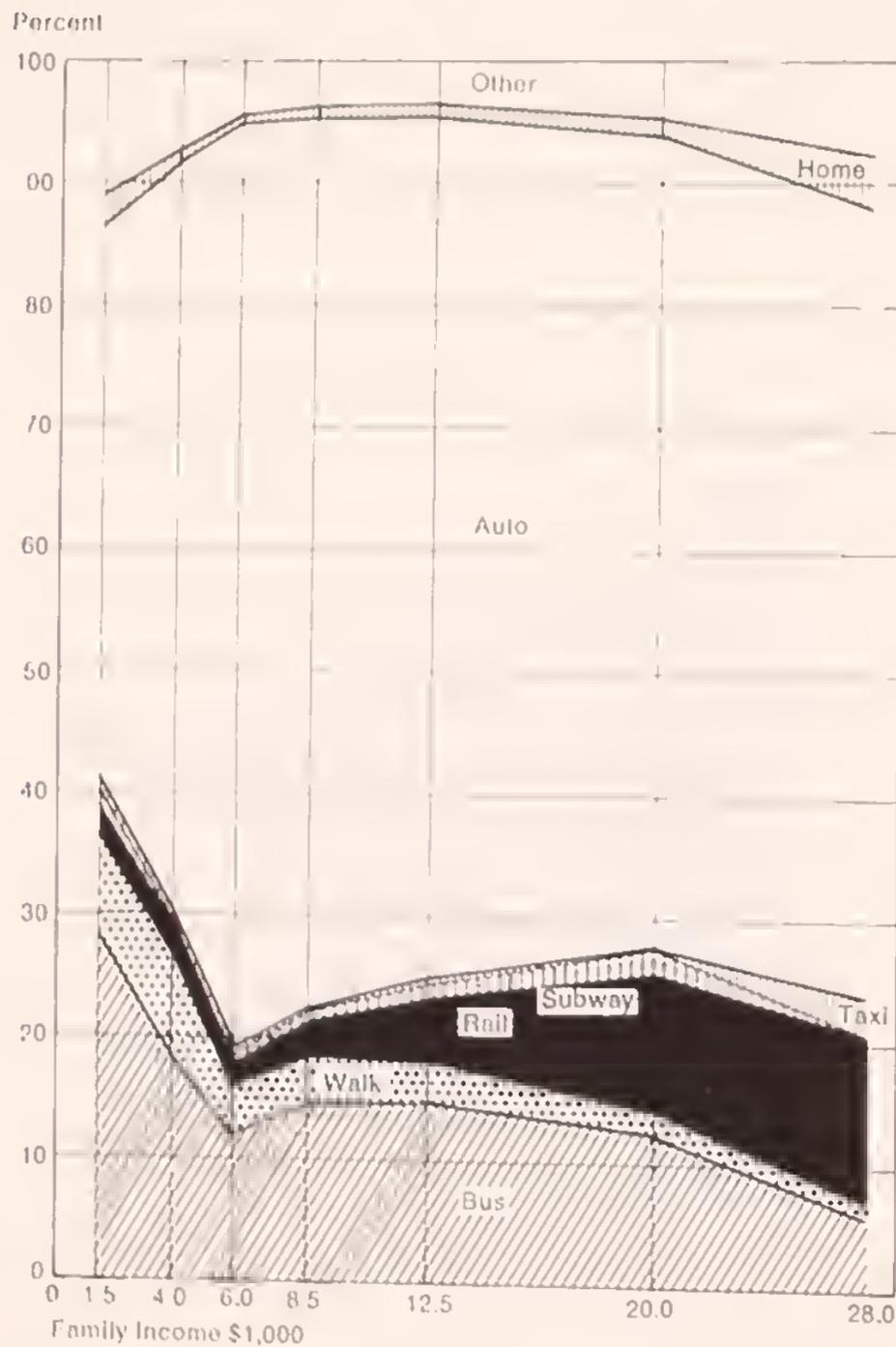
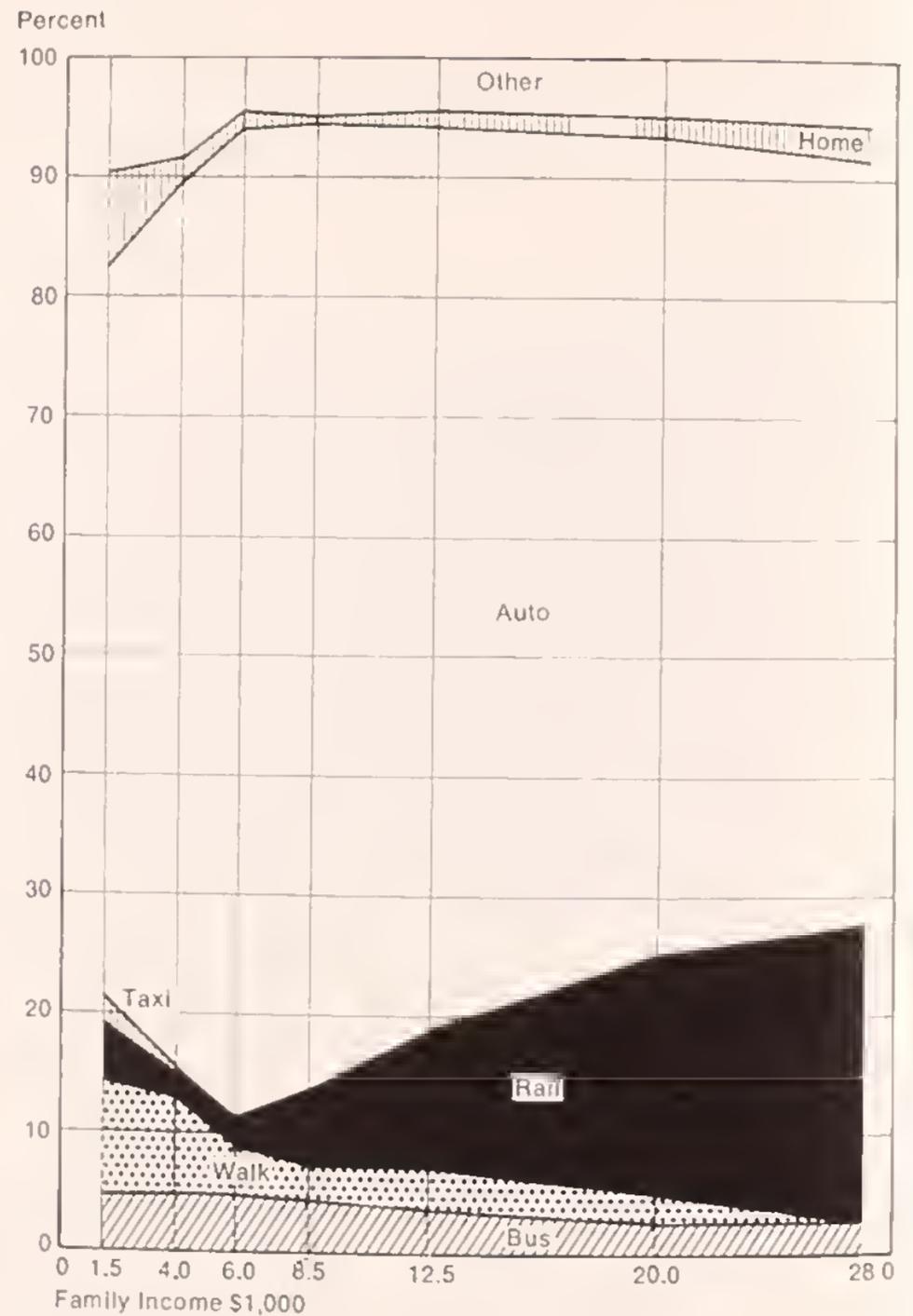


Chart 15.
Choice of Mode by Income, Morris, Middlesex, Monmouth, Union Residents.



population as a whole: in this sense, Staten Island Rapid Transit riders are more akin to suburban railroad riders, whose use of the railroad rises with rising auto ownership.

Despite the relative insensitivity of subway use to auto ownership as such, the decline of subway use among the higher-income brackets demonstrates its unpopularity among many of those who can afford an alternative. It seems clear that rising incomes will lead to further declines in subway patronage, unless the environment and the service are dramatically improved, or unless the use of alternative modes is penalized. It is interesting that the shift to alternative modes with rising income is highest within Manhattan, which has a relatively high level of internal auto and taxi use, and declines for longer-distance

trips from the other boroughs. It can be argued that the pre-emption of the street space by local traffic discourages longer-distance auto trips to Manhattan.

Bus use in the Region is heavily oriented toward short, local trips, but also fills the gap in service from areas where the rail or subway network is poor. For this reason, bus use variation with income shows different trends in different parts of the Region. In Manhattan, as well as in the outer counties, bus use is independent of income. In the bus-oriented New Jersey counties, bus use declines sharply but rather irregularly with rising income; the decline is from about 28 percent of all low-income workers to about 12 percent of the workers in the \$5,000 to \$7,000 group. In the Region's Core outside Manhattan and other close-in counties, the decline is less steep,

Chart 16.
Choice of Mode by Income, Nassau, Westchester, Fairfield,
Suffolk Residents.

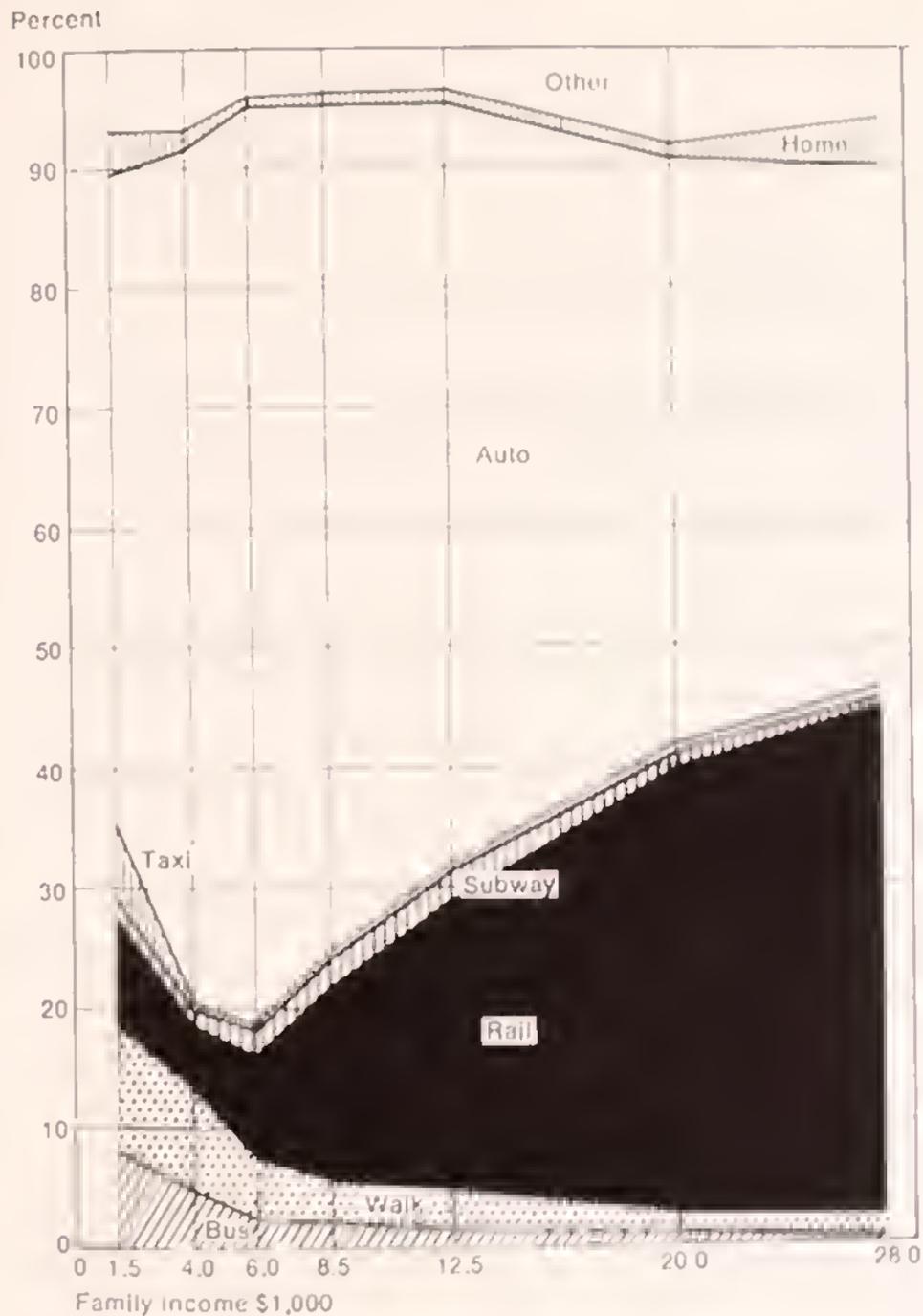
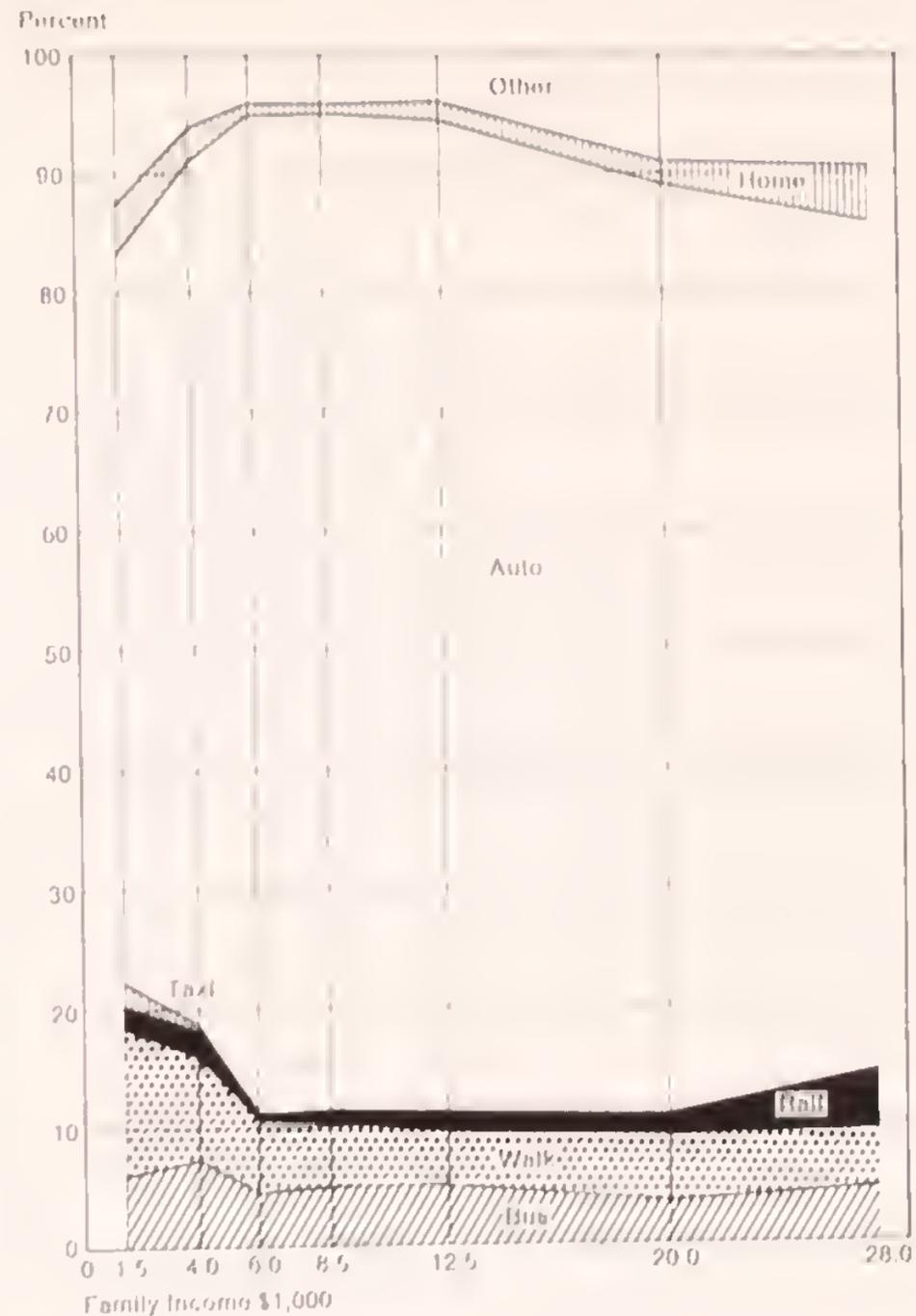


Chart 17.
Choice of Mode by Income, Mercer, New Haven, Dutchess
Residents.



but noticeable, and occurs at the expense of increasing auto or rail use (Charts 13, 14, and 16).

In pronounced contrast to rail and subway, the bus is very sensitive to auto ownership (Chart 25). In the area of highest bus use, the Bergen-Passaic-Essex sector, bus use declines from 42 to 14 percent as auto ownership increases from 0 to 1, and continues to decline as auto ownership rises. Similar declines, from over 15 percent to near zero can be observed in the other suburban sectors. One can speculate that if taking the auto to a rail station is an established practice, as is the one of leaving the car at home while one takes the subway, taking the auto to a bus stop is rather rare: unless one travels to Manhattan, the inducement is to continue the journey by auto, and to use the auto, if one is around. Thus, rising auto ownership

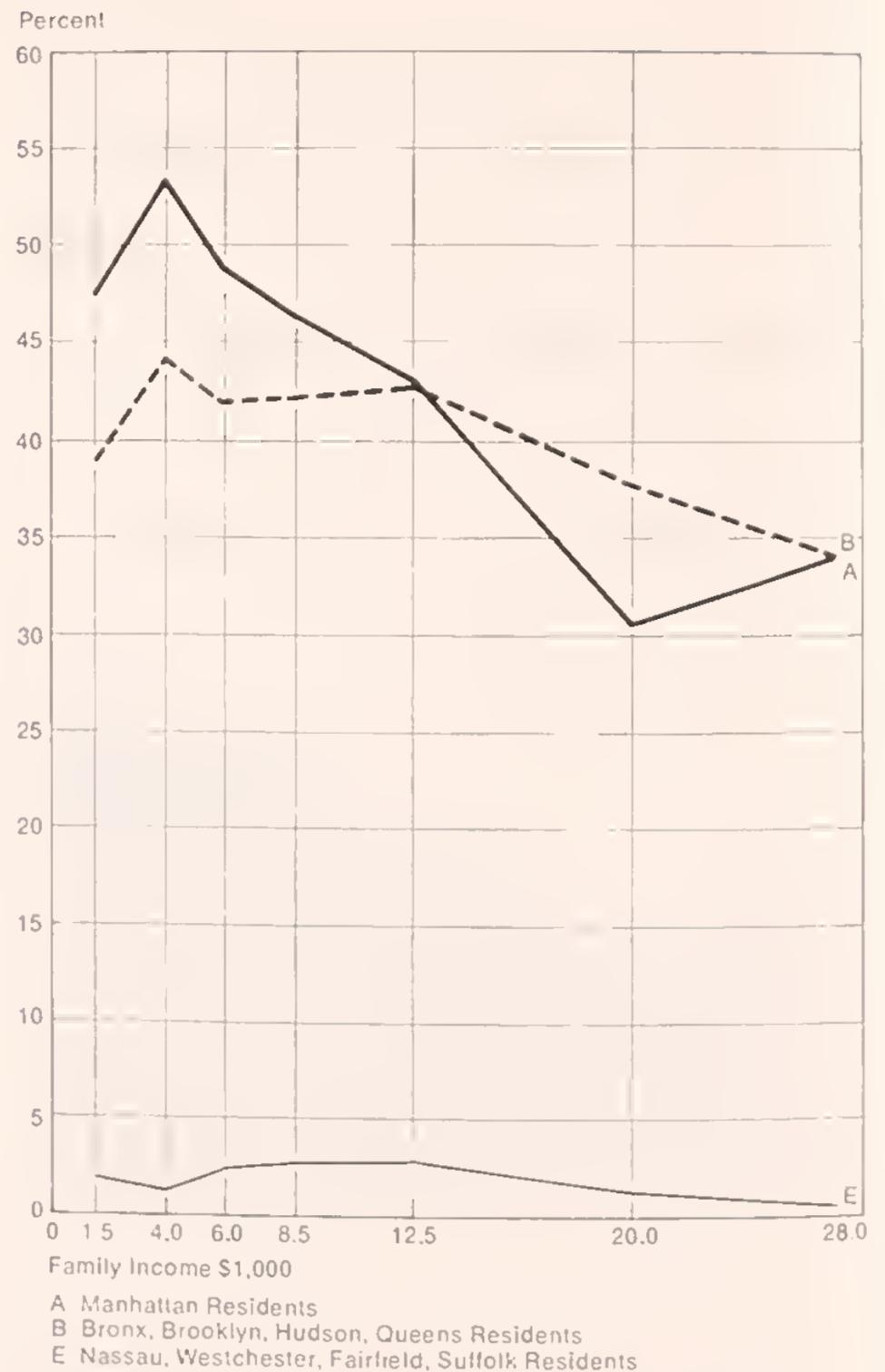
does portend a continued erosion of bus use for intra-suburban trips, a phenomenon that has indeed been occurring since the 1960 Census.

Walking to work, the original mode of travel, cannot be expected to have a great future, at least in the near term, if relationships displayed by the 1960 Census persist. Everywhere except in Manhattan, walking to work drops off precipitously as income rises, from about 9 to 13 percent in the below \$3,000 income group to less than 6 percent in the \$5,000 to \$6,000 income group, and continues to decline to between 0 and 5 percent as income rises to over \$25,000. Only in Manhattan does walking to work stay constant, at about 12 percent, for all income groups above \$3,000. In other places, households with middle- to high-incomes do not seem to seek housing within walking

Chart 18.
Use of Rail to Work by Income Group.



Chart 19.
Use of Subway to Work by Income Group.



distance of their jobs. A few such housing opportunities exist in older counties with a mixed residential density pattern and sub-centers of employment (Passaic, Essex, Mercer, New Haven), but virtually none are to be found in the newer, low-density counties.

The effect of auto ownership on walking is even more pronounced than that of income (Chart 27), with 15 to 30 percent of the no-car heads of households walking, as contrasted with less than 5 percent of those with cars. Hudson County, however, provides the clue that walking may be less dependent on auto ownership in high-density areas. In general, the decline of walking with increasing income and auto owner-

ship is quite similar to the decline in bus riding, and rather the opposite of the rail and subway patterns.

Auto travel to work represents virtually all the remaining travel, after rail, subway, bus and walking are accounted for. If walking can, on the whole, be termed the poor man's mode, and suburban rail the rich man's mode, auto travel clearly emerges as the middle class mode. In most of the areas under study, auto travel to work increases from roughly 55 percent to over 75 percent as incomes rise from under \$3,000 to about \$7,000, reaches a peak, and begins to decline slowly as income rises further, largely due to the effect of rail. Only in Manhattan and the four high-

Chart 20.
Use of Bus to Work by Income Group.

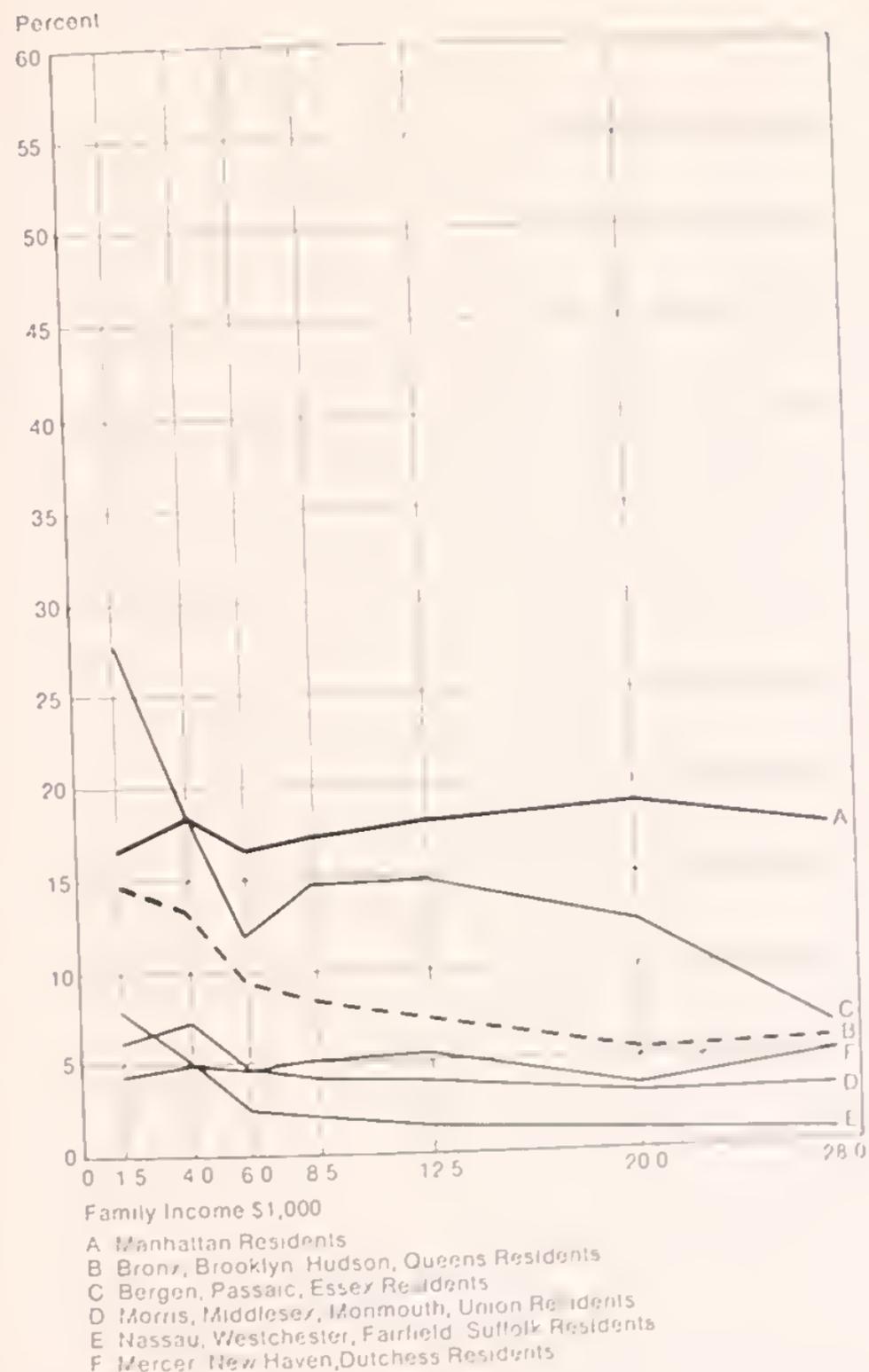
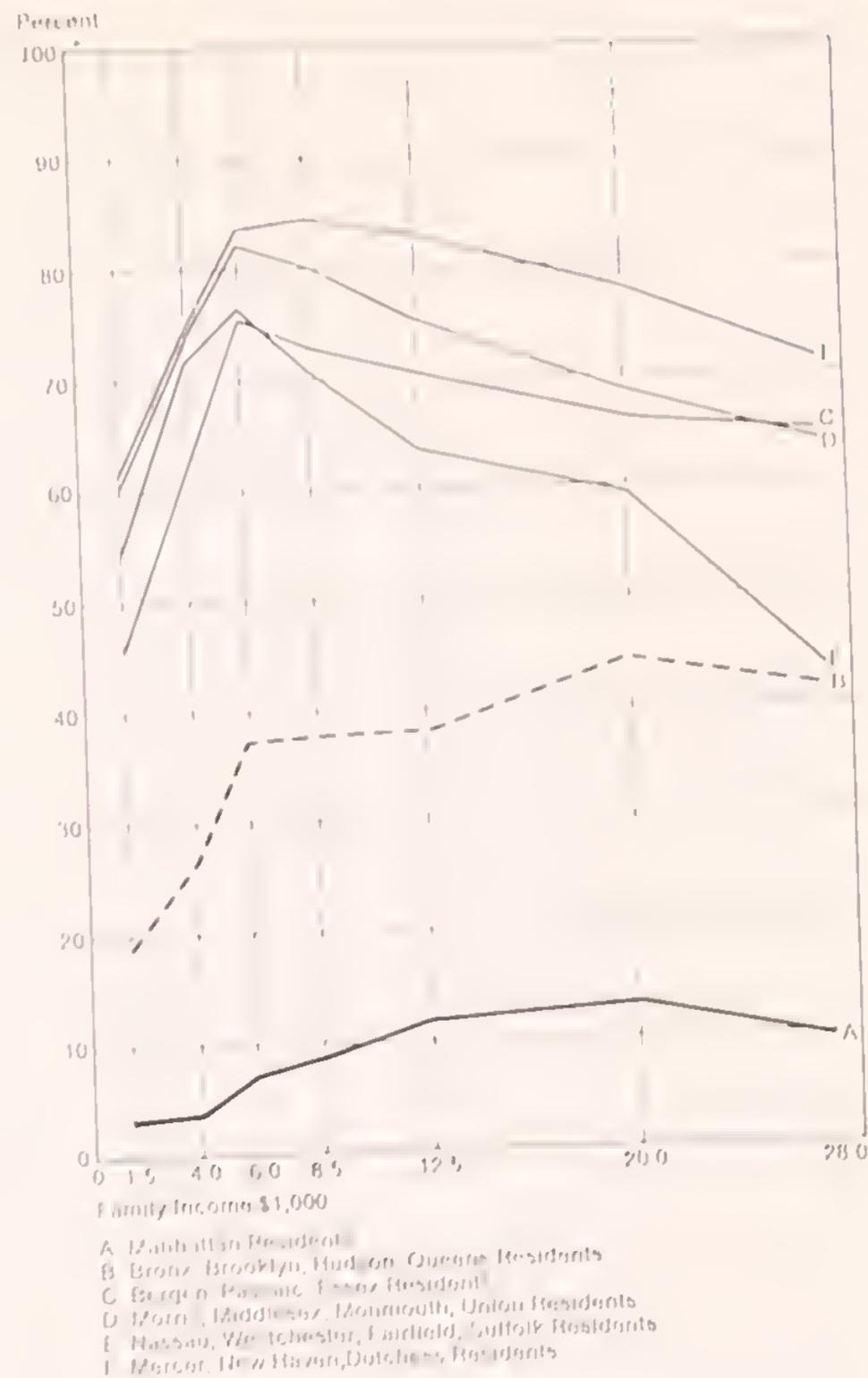


Chart 21.
Use of Auto to Work by Income Group.



density counties around it is the peak of auto use shifted into the \$15,000 to \$25,000 income bracket (Chart 21) because of its high cost.

Quite obviously, auto use for journeys-to-work rises steeply with rising auto ownership, from about 30 percent among the no-car households to an average of over 70 percent among the 1-car households, and reaches a peak among the two-car households; three-car households register a slight decline. The pattern in Hudson County is much flatter, suggesting what might be happening in New York City.

Taxi trips to work exhibit a spectacular rise with rising income in Manhattan (Chart 23), but other than

that are of virtually no import. Interestingly, taxi use is shown to be slightly higher among the lowest income group than among the lower-middle class groups.

Summarizing the use of the different modes for travel to work by the lowest income group in the four densely populated counties outside Manhattan, and comparing it to the average use of these modes by the entire population, the picture shown in Table 56 emerges.

It is apparent that not only automobile but also subway use among heads of low-income households is less frequent than among workers on the average; bus

Chart 22.
Walk to Work by Income Group.

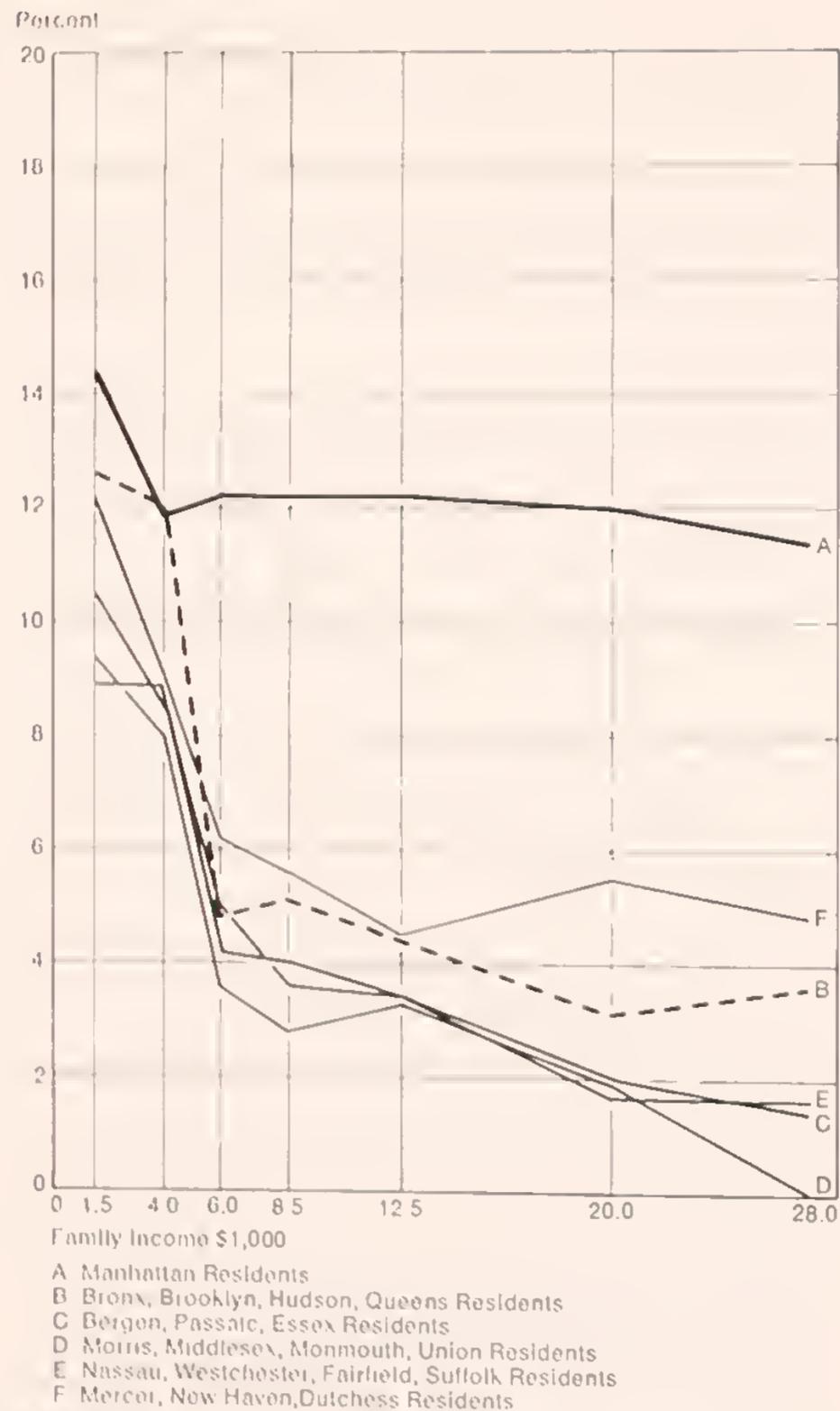
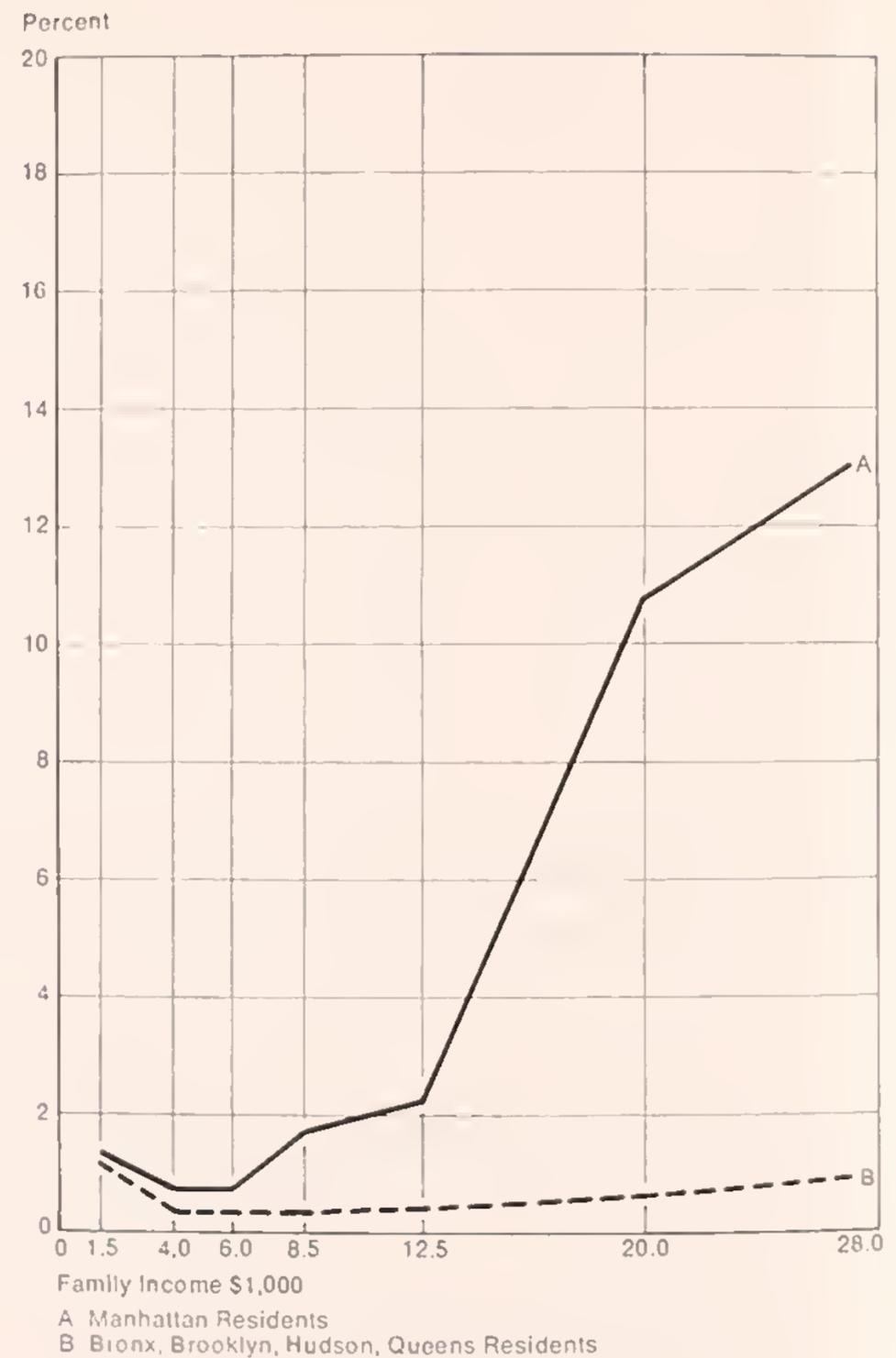


Table 56.
Mode of Travel to Work by the Lowest Income Group Compared to All Workers in 1960.

Mode of Travel	Percent of Heads of 3-4 Person Households in the Below \$3,000 Class		Percent of All Workers (from Table 55)	
	Brooklyn, Bronx, Queens, Hudson	Manhattan	Brooklyn, Bronx, Queens, Hudson	Manhattan
Subway	40	47	46	46
Auto	19	5	25	7
Bus	15	17	15	21
Walk	13	15	10	15
Rail	2	4	1	1
At Home and other	11	12	3	8
Total	100	100	100	100

Source: Regional Plan Association, based on 1960 Census

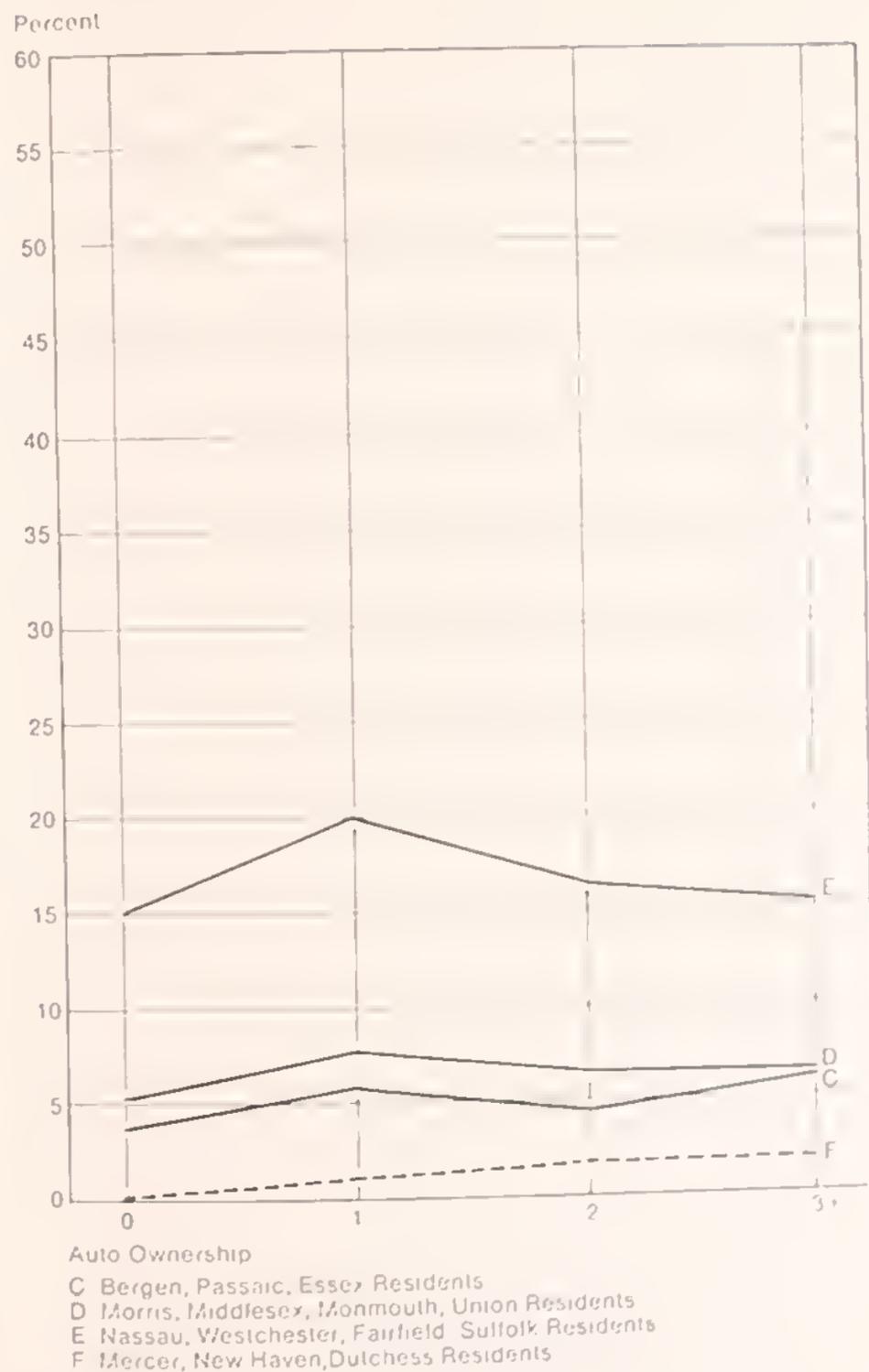
Chart 23.
Taxi to Work by Income Group.



use is the same outside Manhattan, lower in Manhattan. Walking is more frequent (though there is no difference in Manhattan); the largest difference occurs in the "at home" and "other" categories, confirming the accepted notion that truly low-income workers simply make less use of mechanical modes of travel even for the journey-to-work. The inclusion of secondary wage-earners in the first column of Table 56 would tend to increase the contrast, since secondary wage-earners are even less likely to use such long-distance modes as subway, auto and rail.

In the earlier discussion the thought was brought out that the choice of mode in general depends on (1) the employment density at the place of employment,

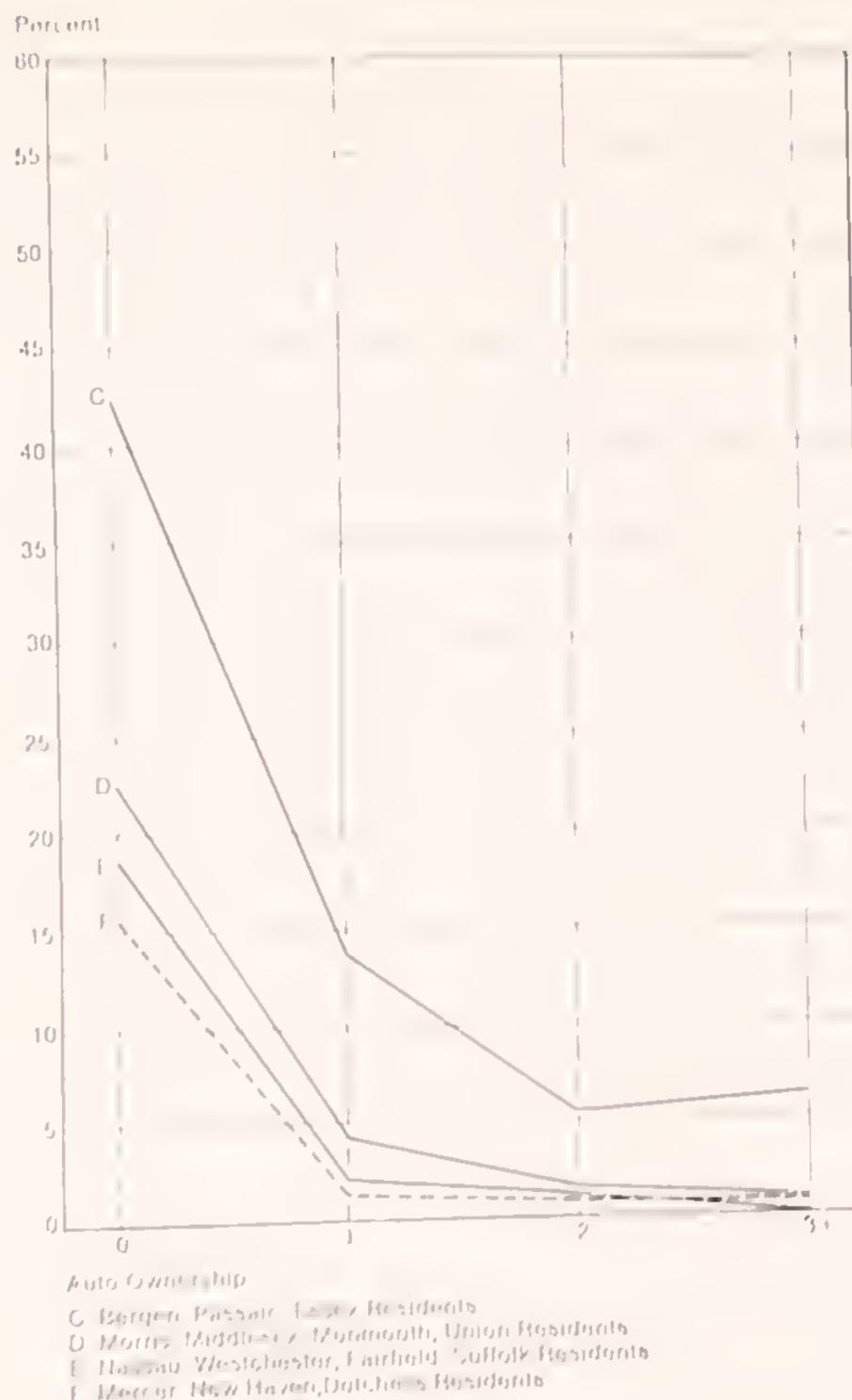
Chart 24.
Use of Rail to Work by Auto Ownership.



(2) the residential density at the place of residence, and (3) the availability and performance of public transportation systems. That is, as these three variables rise, the use of public transportation rises, and the use of the automobile declines. Based on journey-to-work data between specific places (counties and smaller areas) in the New York Region, this proposition can be verified statistically, by means of regression analysis. This was done as part of earlier work by Regional Plan Association.*

The result of this statistical analysis is an equation, which shows exactly how the percent of workers using public transportation, as opposed to the auto-

Chart 25.
Use of Bus to Work by Auto Ownership.



mobile, varies with these three variables. The first two variables can be termed environmental variables, since they describe the urban setting in which the trips occur. This third variable can be called a system variable, since it describes the performance of the transportation system. In the course of the analysis, this last variable, in turn, was broken down into three components, one showing whether a direct rail transit

* *Mode Choices: Implications for Planning*, by Jeffrey M. Zupan, Highway Research Record 251, Highway Research Board, Washington, D.C. 1968, pp 6-25.

Chart 26.
Use of Auto to Work by Auto Ownership

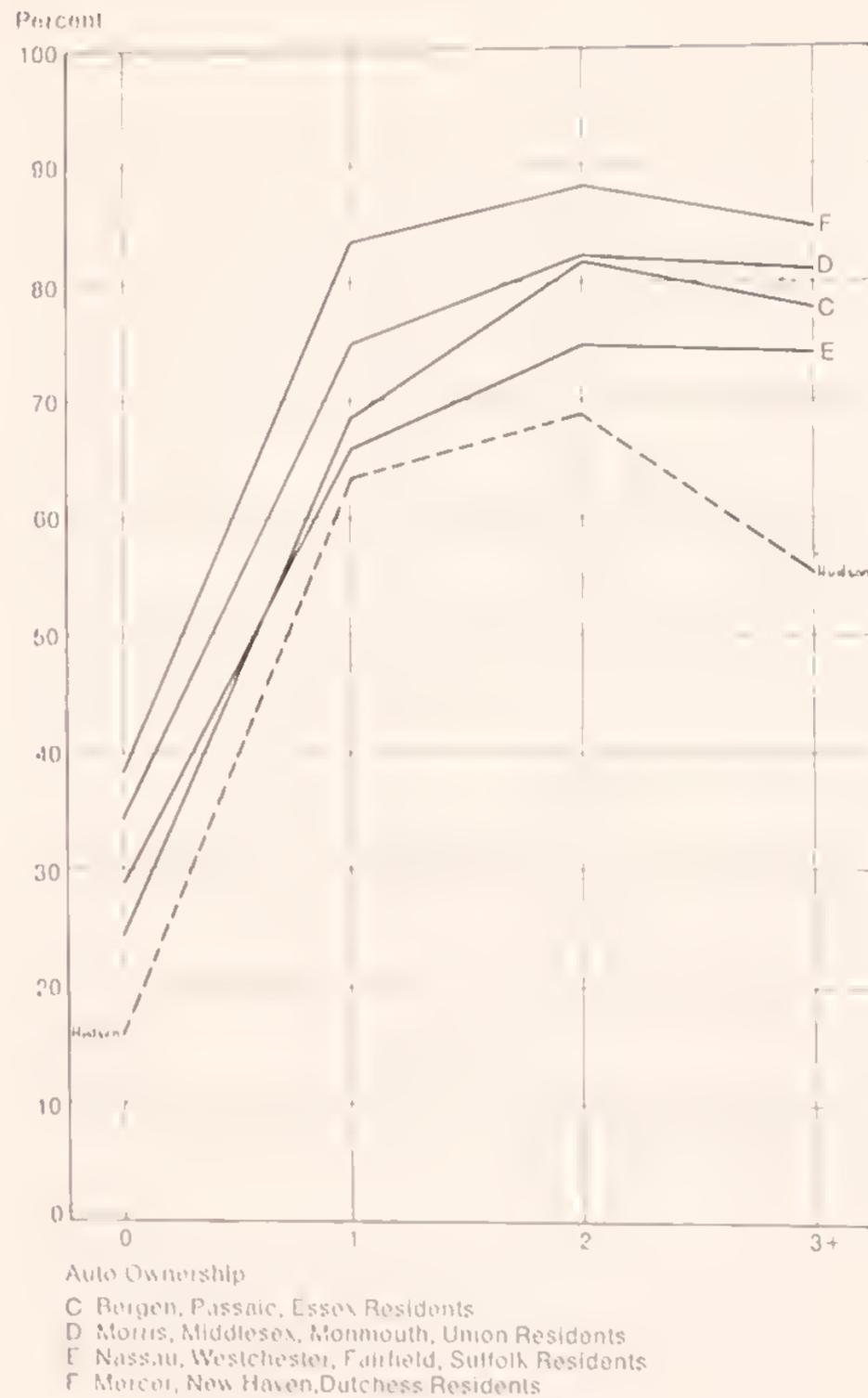
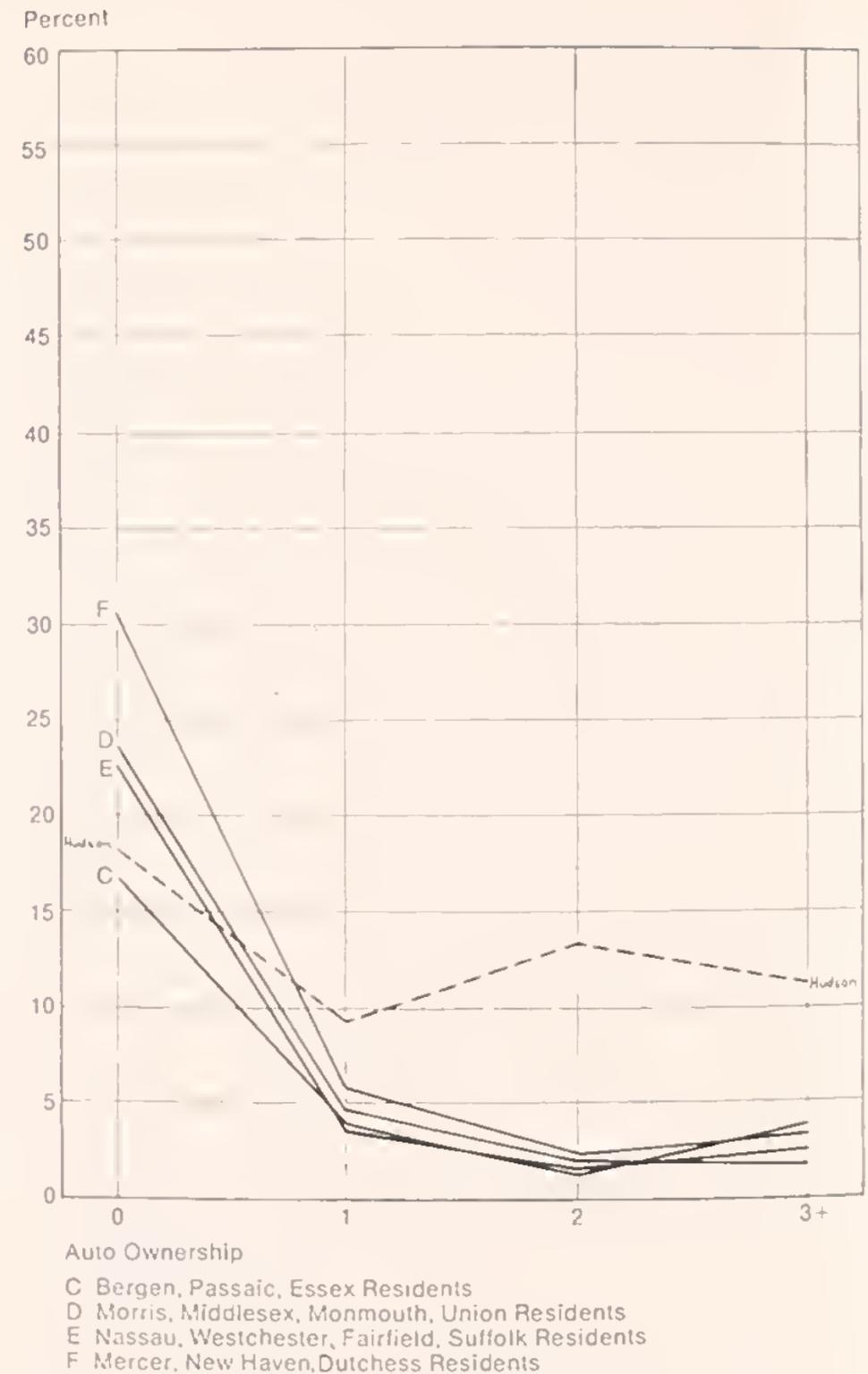


Chart 27.
Walk to Work by Auto Ownership



trip between two places is possible, called the Service Factor (SF), another indicating the ratio of travel time by auto to travel time by transit over that route (TA/TT), and finally the cost of tolls and parking fees in dollars (TP). Fares on public transit and over-the-road costs for autos were not found to influence the choice of mode significantly. The equation, valid for the aggregate of all income groups, is shown below, and its parameters are explained in Table 57.

As indicated there, the environmental variables--that is, the density of employment at the place of employment, and residential density at the place of residence--explain 62 percent of the variation in transit

vs. auto use between particular places in the Region, shown by the Census. Only 14 percent of explanation is added by the variables pertaining to the transportation system. However, each of the system variables, taken in isolation, does have considerably greater explanatory power, anywhere from one-fifth to over one-third. This overlap is due to the fact that the two sets of variables are to some extent associated to each other--where density is high the relative performance of the transit system is better *ipso facto*. Considering the coarseness of the data used, and the existence of other variables, not easily quantified, explaining 76 percent of the reasons for transit use with five

Modal split equation:

$$\% \text{ transit} = 7.756 \left(\ln \frac{ED}{1000} \right) + 2.723 \sqrt{\frac{RD}{1000}} + 17.884 SF + 20.474 \left(\frac{TA}{TT} \right) + 0.112 TP - 14.520$$

Table 57.
Parameters Used in Modal Split Equation.

Parameter	Cumulative % of Variation Explained by Multiple Regression.	% of Variation Explained, Simple Regression.
1. ED — employment per sq. mile of developed land in zone of employment (weighted).	43.9%	43.9%
2. RD — resident workers per sq. mile of non-residential land in zone of residence.	62.0%	11.1%
3. SF — service factor (equal either 0 or 1)	70.9%	38.4%
4. $\frac{TA}{TT}$ — ratio of auto travel time to transit travel time.	74.1%	28.8%
5. TP — tolls and parking fees in cents.	75.9%	21.9%
Multiple regression coefficient	.871	

Note: The functions of the parameters—natural logarithm of employment density and square root of residential density—were chosen to best fit the empirical data.

Source: Regional Plan Association

simple variables is quite remarkable. In the context of this study, it is also of interest how the importance of the five variables varies with income. To find out, a modal split equation was derived separately for each income group, under \$ 5,000, \$ 5,000 to \$ 10,000, and over \$ 10,000. The way in which the five parameters of the equation change with income is shown in Table 58. As the income level rises, the employment and residential density variables carry less weight and the ratio of time and cost variables carry more weight. In the highest income group, the residential density parameter drops out altogether, reminding us of rail use from low-density suburban areas. The service factor follows an erratic pattern, increasing in value from the low to the middle-income level, but decreasing for the high-income level. The constant term of the equations drops as income rises.

Table 58.
Comparison of Modal Split Equation Parameters by Income Group.

Parameter	Low		Income Middle		High	
	Coeff.	Rank	Coeff.	Rank	Coeff.	Rank
\ln ED	9.289	1	7.251	1	7.010	1
RD	2.978	2	2.057	3	—	—
SF	16.431	3	20.572	2	11.399	4
TA/TT	17.447	4	21.875	5	25.849	3
TP	0.043	5	0.167	4	0.307	2
the constant	-2.997		-19.524		-20.413	

Source: Regional Plan Association

What can we infer from these comparisons? Low-income groups are more susceptible to their environment; that is, the choice to travel to work by automobile or transit is determined most often by the variables that measure the characteristics of the home and work locations, and not by the characteristics of the transportation system between travel points. The relative insignificance of the cost term for the low-income group reflects the fact that the poor person is more likely to be a "captive rider". The high-income person, on the other hand, is likely to have a choice to be able to consider freely the merits of the alternate transportation modes; hence the great significance of the cost variable for the high-income individual. People in the middle-income group are a combination of captive and choice riders: less beholden to the environment than the low-income group, yet not as free as the high-income group to choose a mode. The values of the constant terms suggest that as income rises from the low to the middle group the likelihood of using transit declines. This does not contradict the trends shown earlier in Charts 18, or 21, because the reversal of this relationship, shown there, occurs only among the very highest income groups which in 1960 represented about 4 percent of the population. Consistent with that, the high-income constant in Table 58 is close to the middle-income constant.

The one inconsistency in Table 58 is the behavior of the rail service factor coefficient, which decreases from the middle to the high-income group. This result contradicts the thesis that the higher the income is, the more significant are the transportation system characteristics. This inconsistency might be explained by the contrast between the New York City subway system and the commuter railroads. Both warrant service factors, but for very different service. The high-income individual is not likely to be greatly influenced by the service factor for origin-destination pairs served by the subway. The subway for him is less attractive than his automobile, while the commuter railroad is a satisfactory alternative to driving. People in the low- and middle-income groups are likely to find the subway cost more attractive than the high cost of owning and using a car to drive to work; hence the higher coefficients.

Having surveyed travel behavior related to choice of mode we can now turn to the characteristics of the transportation systems themselves.

The railroad network

The passenger railroad network in the Region currently consists of 1,086 route miles of line, about half the railroad route-mileage that had passenger operations in 1950, and one-third that of 1900. However, most of the abandonments have occurred in the outer parts of the Region, so that the shape of the network passing through New York City proper--about 80 miles--is not too different from what it was some 50 years ago. Following the mergers of the past decade, the network is operated by four major entities--the Penn Central Railroad, carrying 49 percent of the passengers in the Region, the State-owned Long Island Railroad, carrying 40 percent, and in New Jersey, not entering New York City directly, the Erie-Lackawanna (7 percent) and the Jersey Central (3 percent). Suburban operations of the Reading Company also extend into the New Jersey part of the Region, but carry less than 1 percent of the traffic. Responsibility for operations in the New York State sector lies with the Metropolitan Transportation Authority (MTA); in New Jersey, rail operations and subsidies are the responsibility of the State Department of Transportation, and in Connecticut similar duties are performed by the Connecticut Transportation Authority. Long-distance trains are a Federal responsibility, under Amtrak.

The total number of passengers carried over the Region's network in 1967 was 183 million, of whom about 144 million were suburban. Over the six years preceding 1967, the number of suburban passengers has remained fairly stable: the Long Island gained about 3 million, the smaller New Jersey railroads and the New Haven line of the Penn Central lost about 5 million; long-distance services lost about 8 million. These figures are based on ticket sales and tend to overestimate the actual number of trips made; for an average weekday, the latter is on the order of 530,000, or about 1.3 percent of all trips made by mechanical means in the Region in 1970; however, since the railroad trip is about 6 times longer than the average trip, the person-miles of travel by rail may amount to about 8 percent of all person-miles of travel in the Region. Of the 530,000 daily rail trips within the Region, some 310,000 are made directly to and from the Manhattan Central Business District, via Pennsylvania Station and Grand Central Terminal, while about 170,000 begin or end at inner New Jersey (Hoboken, Newark) or New York City terminals short of the CBD, either continuing to and from the CBD by other modes, or having origins and destinations elsewhere in the Re-

gion's Core. The remaining trips have more peripheral origins and destinations.

The utilization of the more than 1,000 route miles of railroad line in the Region is rather uneven, if one compares the 28 or so radiating branches, and declines sharply as distance from the center increases. The volume of traffic reaches its peak at a distance of about 10 miles from Manhattan; at a distance of 30 miles, traffic is generally only 5 to 20 percent of this peak, except on the New Haven and the Pennsylvania mainlines, where it is about 45 percent, and does not drop down to the 5 to 20 level until one moves 50 miles out. On the other lines, it is around 1 percent at that distance. The differences between lines reflect differences in average trip length, indicated in Table 59. The really heavily used part of the system can be identified as the electrified territory, which presently accounts for 392 route miles, or 36 percent of the system, but carries more than 80 percent of all the person-miles of rail travel.

The service frequency and average speed is, quite plausibly, also higher in electrified territory. Generally, average over-the route operating speeds, which include stops, range from about 20 mph to 40 mph, depending on equipment and number of stops; however, the effective airline door-to-door speed (as the crow flies) is about half that, and ranges between 12 and 20 mph. Nevertheless, the suburban railroad, even prior to current improvements, did represent the fastest mode of travel for Core-oriented trips in the Region.

In attempting to determine to what degree suburban railroads can help open the doors of the ghetto, three factors are relevant: (1) the geographic disposition of the railroads in relation to the low-income areas and potential places of employment; (2) the operational characteristics of the railroads; and (3) fares.

As is common knowledge, New York's low-income areas appear to be conveniently situated with respect to the railroad network: all of the suburban trains to the north pass through Harlem and the South Bronx, making, theoretically, 32 percent of the stations on the entire system outside New York City (those in the northern sector and in Connecticut) accessible to residents of these areas. The low-income areas of Central Brooklyn are traversed by the Atlantic Avenue line of the Long Island Railroad, which provides about one-fifth of the total service from Long Island, and with or without a transfer at Jamaica makes almost all of the Long Island stations--or 27 percent of those

Table 59.
Passenger Railroads in the New York Region.

Sector	Physical Characteristics 1971		Passenger Stations	
	Route Miles of Line	Electrified	Total	In NYC Low-income Areas
New York City	80	72	55	16
Manhattan	9	9	3	1
Brooklyn	6	6	3	3
Bronx	24	24	17	8
Queens	41	33	32	4
Long Island	250	81	119	
Northern N.Y.	253	47	88	
New Jersey	365	137	170	
Connecticut	138	55	48	
Region Total	1,086	392	480	

Source: Regional Plan Association

Railroad	Passenger Traffic, 1967			
	Annual Revenue Passengers ^a (in millions)	Average Trip (miles)	Passenger Revenues (in millions \$)	
			From Fares	Total ^c
Penn Central	90.0 ^b	40.6	151.4	282.0
Long Island	74.1	24.4	68.6	71.2
Eric				
Lackawanna	13.5	22.6	10.5	22.3
Central of				
New Jersey	5.5	20.0	3.8	8.0
Total	183.1	32.1	234.3	385.3
Suburban Service	144.2 ^d	n.a.	130.3	167.6

^aBased on ticket sales, overestimates actual ridership on multiple trip tickets

^bIncludes 39.0 million passengers in long-distance service, of whom 31.5 are on the former Pennsylvania Railroad, partly reflecting operations beyond the Region

^cAll revenue assignable to passenger service, including operating subsidies

^dIncludes 0.1 million Reading Company passengers not included in above total

Source: Tri-State Regional Planning Commission

on system outside the City accessible. Only the railroad network of New Jersey lacks access to low-income areas. Within New York City, about one-third of all stations are situated in such areas. This may be partly reflected in the fact that rail use for the journey to work among the lowest income group is higher than income alone would suggest.

However, what looks good at the regional scale ceases to be quite so attractive at the scale of the neighborhood. Assuming a median walking distance of 2,000 feet, the territory within walking distance of a station is small: half the walkers can be expected to come from only 0.3 square miles immediately adjacent to the station, assuming that the density of opportunities (residences or jobs) is even. Considering the extent of the low-income areas, and the fact that many stations are irregularly or inconveniently located (i.e. along the Harlem River) it becomes clear that only a minority of the low-income areas' residents can reach the railroad on foot; the proportions are roughly 37 percent in the South Bronx, 3 percent in Manhattan, 9 percent in Brooklyn and 11 percent in Queens, for a

total of 13 percent of low-income area residents; for others, an added trip by an auxiliary mode, such as bus, is called for.

The situation becomes more difficult at the suburban end of the trip: using the 2,000 foot walking distance, less than 10 percent of the land in urban development outside New York City is readily accessible to railroad stations on foot. Inbound commuters overcome this separation by being driven or driving to the station; for outbound workers, means of delivery to the job sites are generally unavailable and must be provided by the employer. Even though, at the regional scale, areas containing manufacturing and warehousing plants appear to be near railroads, in practice the distance to the nearest passenger station is usually one to several miles; the layout of the industrial area also in no way encourages walking. Nevertheless, some of the opportunities are discussed later in Chapter 5.

More conducive to out-commuting is the operational pattern of the suburban railroads. They are characterized by an extremely sharp morning inbound peak, by a somewhat flatter evening outbound peak, but very little activity during off-peak hours: the peaks in the reverse direction are barely higher than the rest of the non-peak activity during the day. Meanwhile, in part because storage capacity at the terminals is limited, some trains do have to depart in the reverse peak direction, even if they have some cars closed off (to economize on the time of conductor) or if they are "dead-heads" (no passengers). Table 60 presents the hourly distribution, by direction, of suburban passenger traffic at Grand Central Terminal and at the Long Island Railroad terminal in Pennsylvania Station. It is evident that less than 2 percent of all passengers leave during the morning reverse-commuting hours of 6 AM to 8 AM, whereas over 60 percent arrive between 7 and 9 AM. Conversely, in the evening, over 50 percent leave between 5 PM and 7 PM, whereas about 3 percent arrive during that time. While hardly any reverse commuters from low-income areas would be boarding trains at Grand Central or Penn Station, these figures are indicative of the service patterns on lines served by the terminals; for the LIRR terminal at Flatbush Avenue in Brooklyn only an incomplete count was available. Tri-State Regional Planning Commission counts, on which Table 60 is based, also indicate the degree to which seats are available on trains during certain periods of the day. The two areas with the highest ratio of passengers to seats are Queens and the Bronx: most of the

lines entering Manhattan pass through them. Trains running through Queens were found to have 86 percent of the seats occupied during the inbound morning rush hour; during 21 non-rush hours and during all day in the outbound direction an average of 55 percent of the seats were found filled. Similarly, trains running through the Bronx were found to have 79 percent of the seats filled during the inbound morning rush hour; during 21 non-rush hours inbound and all day outbound the average proportion of seats filled was 60 percent. Since the evening peak outbound load factor is probably similar to the morning peak inbound load factor, it is reasonable to assume that more than half the seats are available in the reverse commuter times.

In considering available capacity in the reverse direction--even given present schedules and operating practices--the magnitude of the potential stream of outbound commuters from low-income areas must be kept in mind. As was previously determined in Chapter 2, the number of lower-skilled blue collar jobs that could be reasonably considered available under conditions of a full-employment economy are about 4,000 in Nassau and Suffolk, under 2,000 in southern Westchester, and 14,000 in New Jersey. On the basis of the modal split relationships presented earlier,

it can be estimated that about 40 percent of the Bronx and Harlem to Westchester commuters, about 25 percent of the Brooklyn to Nassau commuters, and about 35 percent of those to New Jersey, would use public transportation. For the railroads, this would represent an added load of about 1,000 workers going to Nassau County on the Long Island Railroad, and 800 to southern Westchester on the Penn Central. On the Penn Central today, between 6 AM and 8 AM, about 1,150 reverse commuters get on at Grand Central, and another 420 at 125th Street in Harlem. The number getting on further north in the Bronx is hardly greater than the latter, so that no more than 2,000 reverse commuters ride during these two hours; in the same period, about 3,200 seats are operated in the reverse direction, not counting cars that are closed off or in dead-head trains: thus, adequate room is available to accommodate the potential 800 riders. Similar relationships obtain on the Long Island Railroad.

The next and most crucial issue is that of pricing. Table 61 shows the present cost per mile of railroad travel in the Region, on the basis of monthly commuter tickets. It is evident that the fare structure makes rail trips for short distances (5 to 10 miles) expensive,

Table 60.
Hourly Distribution of Suburban Railroad Passengers, 1963.

	Long Island Railroad at Pennsylvania Station.				Penn Central and New Haven Railroads at Grand Central.				LIRR Brooklyn Outbound Volume
	Inbound		Outbound		Inbound		Outbound		
	Volume	% Volume	Volume	% Volume	Volume	% Volume	Volume	% Volume	
12 M-1 AM	135	.2	546	.8	149	.2	558	.8	—
1 AM-2 AM	51	.2	229	.3	59	.1	273	.4	—
2 AM-3 AM	41	.1	0	—	18	.0	10	.0	—
3 AM-4 AM	0	—	98	.1	—	.0	41	.1	—
4 AM-5 AM	76	.1	0	—	—	.0	28	.0	—
5 AM-6 AM	69	.1	111	.2	24	.0	63	.1	—
6 AM-7 AM	1,563	2.3	226	.3	455	.7	289	.4	—
7 AM-8 AM	12,622	18.7	553	.8	5,266	8.2	857	1.3	—
8 AM-9 AM	31,561	46.8	780	1.1	33,813	52.3	1,044	1.5	—
9 AM-10 AM	8,509	12.6	624	.9	10,953	17.0	1,123	1.7	—
10 AM-11 AM	3,117	4.6	720	1.0	2,803	4.3	526	.8	—
11 AM-12 N	1,751	2.6	822	1.2	1,940	3.0	756	1.1	—
12 N-1 PM	1,209	1.8	884	1.3	806	1.2	1,105	1.6	—
1 PM-2 PM	767	1.1	1,237	1.8	1,132	1.8	1,013	1.5	—
2 PM-3 PM	795	1.2	1,478	2.1	883	1.4	1,627	2.4	1,586
3 PM-4 PM	613	.9	3,376	4.9	888	1.4	2,449	3.6	2,533
4 PM-5 PM	1,145	1.7	9,173	13.2	666	1.0	8,381	12.4	3,621
5 PM-6 PM	689	1.0	28,070	40.4	1,085	1.7	31,503	46.5	9,909
6 PM-7 PM	725	1.0	10,039	14.5	1,168	1.8	8,866	13.1	3,072
7 PM-8 PM	457	.7	4,191	6.0	487	.8	2,273	2.4	1,542
8 PM-9 PM	421	.6	2,725	3.9	528	.8	2,468	3.6	1,669
9 PM-10 PM	430	.6	1,260	1.8	648	1.0	1,032	1.5	—
10 PM-11 PM	268	.4	1,304	1.9	105	.2	877	1.3	—
11 PM-12 M	438	.6	1,045	1.5	697	1.1	653	1.0	—
Total	67,452	100.0%	69,491	100.0%	64,593	100.0%	67,815	100.0%	

Source: Tri-State Regional Planning Commission; NYS Office of Transportation.

on the order of 10¢ per mile, in order, among other things, to discourage excessive diversion from subways, and that for distances of around 50 miles, the cost comes down to 2.5¢ per mile. That means that for distances of interest for reverse commuting, between about 10 and 35 miles, the cost per trip is generally around \$1, and up to \$1.40 on the Long Island. This is confirmed by the passenger revenue figures in Table 59 earlier. For a suburban commuter making \$20,000 a year, an annual commuting cost of \$500 represents 2.5 percent of his income. For a semi-skilled worker making \$100 a week, this would represent 10 percent of his income, and would be impossible to manage, particularly if an added cost of access to the rail station would be incurred. A more detailed discussion of necessary pricing discounts is included in Chapter 5. Suffice it to say here that at least a 50 percent discount, and desirably a 75 percent discount, on commuter tickets in the reverse direction during specified hours of the day and from specified stations is necessary, if a meaningful attraction of workers from low-income areas is to be achieved.

Table 61.
Suburban Railroad Fares Per Mile, by Distance Travelled.

	Distance Zones (miles); Cost in Cents									
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
LI Sector										
1968	—	9.9	6.8	5.1	4.2	3.7	3.3	3.0	2.7	2.5
LIRR 1972	—	14.2	9.0	7.0	5.4	4.7	4.2	3.8	3.4	3.1
North Sector										
NYC 1968	—	7.7	4.6	3.9	3.3	2.9	2.7	2.5	2.4	2.3
1971	—	8.7	5.4	4.3	3.8	3.3	3.0	2.7	2.6	2.5
New Haven										
1968	—	—	—	4.5	3.9	3.4	3.1	2.9	2.8	—
NJ Sector										
CNJ 1968	—	—	—	4.2	3.7	3.3	2.9	2.6	2.4	2.2
E-L 1968	—	9.6	6.6	5.1	4.2	3.7	3.3	3.0	2.7	2.5
PRR M.L.										
1968	—	—	4.6	4.4	3.9	3.5	3.0	—	—	—
PRR Shore										
1968	—	—	—	—	—	3.3	3.0	2.7	2.4	2.2

Note: Calculated by assuming 42 rides per monthly ticket.

Source: Regional Plan Association.

Last but not least, in order to be successful in attracting low-income workers to suburban jobs, reduced reverse commuting fares must be coupled with job-training and job-placement programs; without special efforts, low-income workers are likely to remain unfamiliar with suburban job locations and the means of getting there, because of the long distances involved.

The rapid transit network

The rapid transit network in the Region currently consists of 268 route miles of line, confined mostly to New York City, as Table 62 shows. Its history dates back to 1868, when the first elevated line opened; between 1900 and 1920, about half the present system was built; another third was built between 1920 and 1940, when the extent of the system reached its peak with 278 miles. Since that time, the demolition of old elevated lines, which started after 1930, has out-paced new construction on the surface and in a few short sections in tunnel. In the course of its history, the network evolved into five distinct systems of unequal size: the IND-BMT Division (154 miles) and the IRT Division (83 miles), both operated by the New York City Transit Authority under MTA; Staten Island Rapid Transit (14 miles), recently also taken over by the MTA; in addition, the Port Authority Trans-Hudson Corporation operates the former Hudson Tubes between Manhattan and Newark (13 miles), and the Newark City subway (4 miles) is a private franchise of Public Service Coordinated Transport. The IND-BMT and the SIRT have compatible equipment, with 10-foot wide cars; those of the IRT and PATH are 14 1/2 inches narrower; the Newark Subway operates trolley cars.

The ridership on these systems reached a peak of almost 2.2 billion revenue passengers annually in 1930*, and another one of 2.1 billion in 1947; since about 1955, ridership has levelled off at around 1.3 billion, as Table 63 and Chart 28 show. The New York City Transit Authority systems account for 97 percent of this ridership; PATH accounts for slightly over 2 percent, and the remainder is divided between the SIRT and the Newark subway. In fact, the Transit Authority accounts for over 80 percent of all the rapid transit passengers in the nation. On an average week-day basis, this represents almost 4.7 million trips, divided among the systems as shown in Table 62. The table also indicates that the average subway trip is 5.9 airline miles (which equals 6.7 over-the-route miles), about the same as the average trip by all modes in the Region. Thus, the rapid transit contribution to all person-miles of travel in the Region is about the same as the 13 percent of all trips by mechanical modes that it represents. Measured in terms

* Unadjusted for the introduction of free interdivisional transfers since 1940.

of person-trips, the rapid transit network is almost ten times as important as the rail network, but in terms of person-miles of travel, it is less than twice as important. By comparing Tables 59 and 62 it also becomes evident that the density of traffic--person-miles per route mile--is more than six times greater on the rapid transit network than on the railroads. The most heavily used subway line--the Lexington Avenue IRT north of 60th street, carries a daily volume of 600,000 passengers, four times more than the heaviest used rail line--the Long Island Railroad out of Penn Station.

However, aside from two trunklines in Queens, which are fed by buses, the flow outside Manhattan drops off rapidly, and the outer extremities of lines, especially in the south of Brooklyn, Staten Island and Queens, and in the northern Bronx, are relatively lightly used; some carry less than 10,000 passengers per day. This is partly due to the moderate residential densities in these areas, but also due to the extraordinarily long travel times. Subway operating speeds, including stops, generally range between 15 mph and 20 mph, but, considering access time and frequently indirect routing, the effective airline door-to-door speed on the rapid transit system is about 9 mph for destinations closer than 8 miles, and drops off to less than that at a distance of 14 miles. It is quite apparent that automobile or railroad trips, which average around 15 mph at these distances, become much more attractive, and recently-introduced express bus routes also focus on these outer parts of New York City, poorly accessible by subway. Still, even within the 8-mile zone, where the subway performs best, its door-to-door speed is about 25 percent below the automobile during rush hours, and about 40 percent below the auto in non-rush hours. The above speeds are based on trips to Manhattan, which accounts for about 80 percent of all subway destinations. Trips within counties other than Manhattan account for about 15 percent of all rapid transit travel, and the remaining 5 percent are trips between counties other than Manhattan.

Apart from its relatively slow speed, a major problem of the transit network is that because of its age, it has not kept up with population and land use shifts in the inner part of the Region which occurred over several recent decades. Extant plans and construction in progress, shown earlier on Map 7, are largely aimed at correcting these deficiencies, such as: a) inadequate service to the East Side of Manhattan; b) insufficient capacity on the approaches

Table 62.
Rapid Transit in the New York Region.

County	Physical Characteristics, 1970					
	Route Miles of Line			Passenger Stations		
	NYCTA	Other	Total	NYCTA	Other	Total
New York City	237	17	254	477	26	503
Manhattan	70	3	73	138	6	144
Brooklyn	85	—	85	173	—	173
Bronx	38	—	38	84	—	84
Queens	44	—	44	82	—	82
Staten Island	—	14	14	—	20	20
Hudson County	—	10	10	—	6	6
Newark	—	4	4	—	12	12
Total Region	237	31	268	477	44	521
Track Miles	720	62	782			

Transit System	Passenger Traffic			
	Average Weekday Passengers (in millions, 1969)	Average Trip Miles, (airline distance)	Annual Revenue Passengers (millions, 1967)	Total Passenger Revenues (in millions \$, 1967)
NYCTA	4.50	5.9	1,298.0	272.87
PATH	0.14	4.9	30.5	9.27
SIRT	0.02	6.2	5.6	2.36
Newark subway	0.01	n.a.	4.1	0.68
Total Region	4.67	5.9	1,338.2	285.18

Sources: Regional Plan Association and Tri-State Regional Planning Commission.

Table 63.
Annual Rapid Transit Revenue Passengers, 1955-1970.

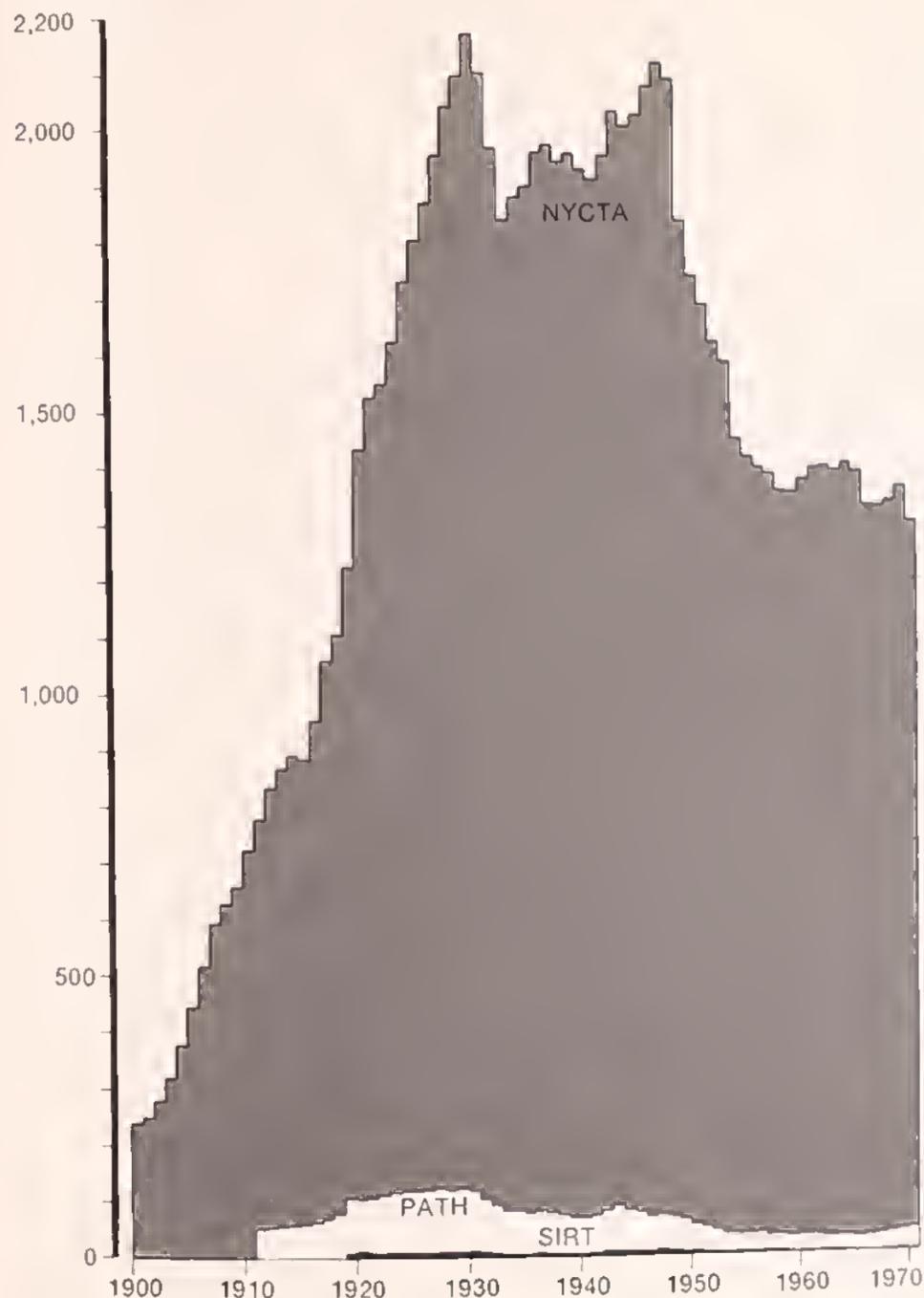
Year	Revenue Passengers (000,000's)		
	NYCTA	PATH	SIRT
1955	1,362 15¢ fare (since 1953)	37	n.d.
1956	1,364	37	n.d.
1957	1,339	30	n.d.
1958	1,322	30	n.d.
1959	1,329	31	4.7
1960	1,349	31	5.0
1961	1,361	32	5.3
1962	1,384	29	5.7
1963	1,356	28	6.0
1964	1,384	28	6.3
1965	1,354	26	5.6
1966	1,263 strike; 20¢ fare	28	5.8
1967	1,202	30 E-L ferry closed	5.6
1968	1,305	35	5.3
1969	1,351	38	5.2
1970	1,209 30¢ fare	39	4.8

Source: NYCTA Transit Record.

to Manhattan from Queens and from the Bronx; e) insufficient speed from outer Queens and outer Bronx; and d) insufficient coverage in Queens--which has the poorest service of any of the boroughs by any measure, because it largely grew up after the shape of the transit network was fixed--as well as in southeast Brooklyn. While the first three problems will be solved if the 63rd Street Tunnel and the Second Avenue subway with their approaches are built, the fourth problem--that of coverage--is more difficult, because of the simple geometric fact that as one moves further out, there is more area between the spokes of radial lines.

Chart 28
Rapid Transit Ridership 1900 to 1970.

Annual Passengers
in Millions



It is generally the outer areas that are growing, while the inner, high-density areas are declining in population. Table 64 portrays the effectiveness of the existing rapid transit system within New York City and of proposed new lines in terms of coverage--where coverage is defined as the percent of the total area that is within walking distance of subway stations, and the percent of the population which lives within that area. "Walking distance," in turn, is defined as 2,000 feet, measured along actual paths in streets, rather than in a radius. The distance of 2,000 feet is longer than the median walk which, outside the CBD, is on the order of 1,400 feet; it is assumed as a distance beyond which walking becomes uncomfortable and noticeable diversion to feeder modes, such as buses, begins to occur.

Table 64.
New York City Subway System Coverage by Borough.

Borough	Percent of Area within 2,000 Feet of Stations		Percent of Population within 2,000 Feet of Stations		Percent Riders Using Bus to Stations
	Present	Future ^a	Present	Future ^a	
Manhattan	73.9	80.4	74.7	82.1	3.9
Brooklyn	48.4	52.7	57.1	60.4	16.4
Bronx	43.4	43.6	60.7	60.8	18.0
Queens	14.7	16.5	21.4	23.4	37.2
Staten Island	8.4	8.4	8.3	8.3	n.d.
Total NYC	29.7	31.9	51.8	55.0	16.7

^a Assumes completion of extant subway plans, but no shifts in population.
Source: Regional Plan Association.

It is evident that at present, slightly over half the City's population lives within 2,000 feet of subway stations, and that, if no population shifts take place, this share will change only slightly as a result of future construction. Thus, the problem of feeder modes--popularly known as the problem of the "double fare"--is likely to remain. It is also evident that Manhattan has the greatest share of its population and area conveniently located with respect to subway stations, and will experience the greatest relative improvement; the service in Brooklyn and the Bronx is comparable, while that in Queens is dramatically lower, both because of lower development densities, and because of the lowest per capita mileage of lines. The percentage of subway riders using buses to get to stations, shown in the last column, generally reflects these deficiencies in coverage.

From the vantage point of this study, it is obviously of interest how the deficiencies in access to the subway system relate to the City's impoverished population. Who has better access to the subway system--the rich or the poor? Table 65 answers this question.

While the differences are not dramatic, partly because of the coarse nature of the data on which these calculations are based, and some simplifying assumptions (i.e., that within postal zones, population by income group is homogeneously distributed), it is clear that with the minor exception of Staten Is-

Table 65.
Subway System Coverage by Income Group, 1966.

Borough	Percent of the Population with Incomes of Less Than \$3,000 Living within 2,000 Feet of Subway Stations	Percent of the Population with Incomes of More Than \$10,000 Living within 2,000 Feet of Subway Stations
Manhattan	75.7	72.6
Brooklyn	59.1	51.8
Bronx	63.3	51.8
Queens	21.2	18.9
Staten Island	8.5	9.0
Total NYC	54.9	43.9

Source: Regional Plan Association

land, the poor have better access to the subway system than the well-to-do. In the entire City, about 55 percent of the poor are estimated to live within 2,000 feet of subway stations, while only 44 percent of those who are not poor do. Understandably so, for poverty areas are mostly confined to parts of the City with an old housing stock that grew up around the transit network 50 to 80 years ago, while well-to-do areas tend to be on the periphery of the City, which developed in the automobile era. More detailed relationships between low-income areas and the areas served by rapid transit are discussed somewhat later in Chapter 5.

Overlaying the map of low income areas on the subway system coverage as shown in Map 24 in the next chapter, we can see which parts of the low-income areas are less accessible to the subway system. There are about 13 such parts, more than 2,000 feet removed from transit stations, as follows:

Manhattan.

1. East Harlem, between the Lexington Avenue subway line and the East River. This area will receive virtually full coverage when the Second Avenue line is completed.
2. Lower East Side, mostly east of Second Avenue, between the 14th street line and the BMT under Delancey Street. Some of the public housing along the East River is over half a mile from the nearest subway station. A special transit loop along Avenue C is planned to serve this area, but the cost-effectiveness of this proposal is open to question.

Brooklyn.

3. The inner part of Bedford-Stuyvesant, framed by the Fulton Street IND, the Crosstown IND, and the Broadway BMT.
4. The inner part of Brownsville, between the IND, the IRT and the Canarsie line.
5. The Fort Greene area north of the IND Crosstown line near the Brooklyn Navy Yard. In all of the latter three cases, distance to the nearest station rarely exceeds about 3,000 feet. All of them are covered by proposals for improved bus service under the Brooklyn Model Cities program.
6. Bushwick, framed by the Broadway BMT, Canarsie, and Myrtle Avenue lines. Again, no part is much more than half a mile from a transit station, and proposed bus improvements are dealt with later in this report.
7. Williamsburg, east of the IND Crosstown line and north of the Canarsie line. This is not a heavily set-

tled area, and much of it is in industrial use.

8. The Spring Creek area along Flatlands Avenue. Proposals for a short extension of the New Lots IRT through its yard would improve access to this area. An alternate proposal to extend the Canarsie line eastward would provide essentially the same service with less frequency and with more construction.
9. The Red Hook peninsula in South Brooklyn.
10. The Sea Gate peninsula off Coney Island.

The Bronx.

11. East Tremont between the White Plains Road IRT and the Third Avenue Elevated. This area is dealt with later in this report.
12. Hunts Point peninsula, south of the Pelham Bay IRT. Though one of the worst in terms of poverty, the area is interspersed with industrial uses, and could be helped by the planned Second Avenue subway extension along the New Haven Railroad trackage.

Queens.

13. South Jamaica. Of all the areas discussed so far, this is the least accessible to the subway system, with parts of it located more than a mile from the nearest station. With proper station spacing, virtually all of it will become accessible, once the Southeast Queens line from Jamaica Center is completed.

It becomes apparent from this discussion that except for South Jamaica, virtually all of the population of poverty areas is accessible to the subway system, once the standard of access is extended from 2,000 feet to about 4,000 feet, or from a comfortable 8 minute walk to a 16 minute walk (a distance that is exceeded by less than 5 percent of the walkers). This is in sharp contrast to many middle- and upper-income areas, mostly in Queens, which are several miles removed from the closest transit station. Of course, they are in a much better position to pay for an access mode, be it auto or bus. It also becomes apparent that purely from the viewpoint of serving poverty areas, the Second Avenue subway is important, and so is the Southeast Queens line through Jamaica. Reconstruction of the Canarsie line elevated through East New York is likewise important to improve both the environment and the performance of the line. Most of the other extant subway expansion plans do not in any direct way involve the City's low-income population.

As was already pointed out, the rapid transit system is heavily oriented toward the Manhattan Central Business District. And the CBD still contains some

560,000 blue collar jobs, or 49 percent of the City's total. As was shown previously, the proportion of lower-income workers travelling to the Manhattan CBD ranges from a high of 66 percent in Harlem to a low of 29 percent in Central Brooklyn. However, industrial districts outside the CBD are less well served by the subway system.

The next largest blue collar employment area, with 143,000 jobs, borders on the East River and Newtown Creek. For planning purposes,* it has been subdivided into three distinct districts. Long Island City-Woodside contains about 47,000 blue collar industrial jobs, is traversed by four subway lines, but its peripheral areas, where many of the plants are actually located, are often beyond a 2,000 foot walk. Williamsburg-Greenpoint, and Maspeth-Newtown Creek respectively contain 47,000 and 49,000 blue collar industrial jobs and are served peripherally by the IND Crosstown line, the Canarsie BMT line, and the Broadway BMT. The walking distances are generally very long, and because of the relatively widespread nature of plant locations, there are no reasonable subway improvements which could enhance access. Improved bus routings will have to be depended upon.

The South Bronx, with 43,000 blue collar industrial jobs, traversed by 5 subway lines, has relatively good access, except for peripheral locations along the Harlem River and on the Hunts Point peninsula. Shifting the Bronx extension of the Second Avenue Subway southward, from 138th Street to the New Haven Railroad yard area, which is slated for large scale new development, would provide access to this project. It would mean that transfers from the Pelham Bay line would have to occur only at Hunts Point Avenue (not at Brook Avenue). However, both of these peripheral alignments would bypass the "Hub" area of the southern Bronx, and postpone indefinitely the replacement of the Westchester Avenue elevated.

The Bush Terminal-Gowanus-Red Hook industrial area in Brooklyn, with 36,000 blue collar industrial

jobs, is moderately accessible to the subway: the waterfront is about 3,000 feet from the Fourth Avenue BMT line, and an elevated IND station serves Gowanus, though not the Red Hook peninsula.

The East New York-Flatlands area, with about 17,000 of the present blue collar industrial jobs, is served by four subway or elevated lines in the north, but its southern portion, including the new industrial renewal sites, is not accessible by subway. A reconstruction of the Canarsie Line elevated in the partially abandoned roadbed of the Bay Ridge railroad branch would provide an inexpensive way to serve this industrial area, as well as unserved residential areas to the south. A subway line under Utica Avenue, included in current plans, would be a three times more expensive way to achieve a similar objective.

Over 15,000 of the City's blue collar industrial jobs are located in the Jamaica-St. Albans area of Queens. The proposed Southeast Queens line through Jamaica Center would improve access to industrial jobs in this area.

The Flushing-College Point area, with about 8,000 of the blue collar industrial jobs at present, but slated to grow under industrial renewal, is barely accessible from the Flushing line in its southern part, but the northern section, including the planned industrial park, will have to depend on bus access.

Lastly, with roughly three-quarters of the City's industrial blue collar jobs accounted for in the clusters enumerated above, there remain the two major airports, Kennedy and La Guardia, and their neighboring industrial areas, each with about 10,000 blue collar jobs. Except for a section of Astoria, neither have subway access, and provision of public transit service delivering workers, rather than merely airport passengers, should deserve consideration.

In sum, it is apparent that rapid transit service to industrial concentrations is much more spotty than that to poor residential areas within the City, and that with the exception of some relatively small adjustments to present plans, no major improvement of the situation can be expected of the subway system. An existing non-CBD oriented transit line, even if it comes close to industrial areas, as the Crosstown IND line between Brooklyn and Queens, does carry sparse traffic: about 30,000 passengers per day, a volume that most radial lines build up only two to four stations away from their terminal. Unless high-rise, high-density industrial structures near transit stations become feasible, as recommended in the New York City Planning Commission report Planning For

* The blue collar industrial jobs by district, identified here, reflect the survey results of the New York City Planning Commission, Planning for Jobs (1971), and differ from the employment estimates by skill contained in Table 22 because all jobs in the selected firms surveyed by CPC were classified blue collar industry jobs and the boundaries established for survey purposes do not correspond with those defined on Map 19 for Table 22.

Jobs (1971), the medium-density nature of industrial sites outside Manhattan and the relatively scattered location of the plants will cause auto access, combined with bus access, to remain more important than subway access. This is demonstrated by the figures presented earlier in Chapter 2, which show that in the manufacturing firms surveyed in New York City outside Manhattan, 44 percent of the workers come to work by automobile.

Manhattan's declining proportion of blue collar jobs, the not-too-convenient subway access to blue collar job concentrations outside Manhattan, the shorter trip length with declining income, and the generally lower propensity of low-income residents to travel, combine to make subway use less frequent in an area, as its poverty status becomes worse. As James W. Whittaker shows,* between 1960 and 1965, while overall ridership on the New York City Transit system increased by 1.3 percent, ridership in poverty areas declined consistently. In Central Brooklyn, the decline was 5.1 percent, in Harlem, 6.2 percent and in the South Bronx 2.4 percent. The decline was even sharper during peak travel periods, suggesting that decline in subway use for the journey-to-work was largely responsible for the drop. The extent to which these drops are simply due to the thinning-out of population from the low-income areas will have to await a detailed analysis of 1970 Census tract data; it is clear that there was a substantial population decline in Harlem, as well as in some of the other poverty areas.

It is quite clear that the mobility of the population in general, and the use of rapid transit specifically, is affected by the out-of-pocket cost of transportation services to the user. Table 63 earlier indicates that subway use in New York City dropped about 4.9 percent in 1966, after the fare went up from 15 to 20¢, and by about 5.4 percent in 1970, when the fare went up to 30¢. In both cases, there were additional factors to aggravate the decline: in 1966, the 12-day transit strike, in 1970, the worsening situation of the economy and a series of operational failures on the transit system. Nevertheless, the declines are clearly associated with fare hikes: during periods of a stable fare (which, in an inflationary situation actually meant a declining fare) there was a tendency for

rapid transit ridership to increase, such as between 1958 and 1964, and between 1967 and 1969.

As of 1970, the average income of a New York City household whose head was travelling to work by subway can be estimated to have been around \$10,000 annually, in current dollars, as opposed to an average income of all City households of about \$9,190. Assuming 1.2 workers per household and 230 working days per year, the annual cost of travel to work by subway for that household, with a 30¢ fare, was \$166 or only 1.7 percent of the household's income. What would happen with various degrees of a fare increase is shown in Table 66.

Table 66.
Annual Subway Journey-to-Work Expenditures for Resident New York City Households at Varying Levels of Subway Fare.

Percent of Household Income Spent on Journey to Work if Fare is:	Average Subway Rider	Low-Income Subway Rider ^a	Average Subway Rider with Double Fare	Low-Income Subway Rider with Double Fare ^a
30¢	1.7%	3.9%	3.3%	7.8%
35¢	1.9	4.5	3.8	9.1
40¢	2.2	5.2	4.4	10.4
50¢	2.8	6.5	5.5	12.9
60¢	3.3	7.8	6.6	15.5

^a Bottom 30 percent of resident subway rider household income distribution, the upper limit of which is nearly equivalent to the BLS lower-income budget threshold for an average size family.

Source: Regional Plan Association.

It is evident that even with a 50¢ fare, the burden on the average subway rider would not be exorbitant, not out of line with what is paid now by the higher-income suburban commuter, and less than what the low-income rider now pays. Even the double fare, to the extent that it affects middle- and upper-income riders, (which is mostly the case, as we have shown) would not be excessive. However, if one accepts about 5 percent of the income as the upper limit to be spent on the journey-to-work, the low-income rider's burden becomes intolerable with a single fare of more than 40¢, and is intolerable with a double fare now. One method of supplementary transit financing these findings appear to favor is a special "transit charge" levied in the manner of an income or payroll tax, calculated as either a fixed or progressively increasing percentage of income. This would mitigate the regressive nature of a fixed fare, and at the same time prevent reduced utilization of the transit system by lower-income riders. This also favors selective elimination of double fares, confined to the relatively few instances when they occur in low-income areas, rather than a universal system of free transfers, which would on the whole tend to favor the well-to-do.

* Transportation Needs of the Poor. Oscar Ornati, James Whittaker, Richard Solomon; Praeger publishers, New York, 1969, p. 21.

A lower level of off-peak fares would also tend to favor the low-income rider, because of his greater use of the transit system for non-work purposes. Of course, surcharges on socially costly types of automobile trips should always complement any transit fare restructuring.

Aside from the fare, an aspect of subway service that affects the poor more than the well-to-do is frequency of service during off-peak hours. Off-peak schedules are written now mostly with the aim of maximizing the utilization of trains--that is, if it takes 15 minutes to fill up a 10-car train at night, trains are run on a 15-minute headway, perhaps with a standing load, with no accounting for the social cost of the time lost in waiting. But as James Whittaker* has remarked, "a standing load at 1 A.M. is absurd, by any standard." As will be seen later in Chapter 5, complaints about infrequent off-peak service were prominent among poverty area residents surveyed in this study. A careful monitoring of off-peak travel, which is more important in poverty areas with their low auto ownership, is necessary in order to adjust train scheduling to demand.

Lastly, there are urgently needed improvements to the subway system which will benefit riders and society regardless of income. These fall roughly into five areas: (1) air-conditioning of cars (about 12 percent of the NYCTA and PATH fleet of 7,300 cars are air-conditioned now, but it will take 32 years at current rates of replacement--about 200 cars annually--to air-condition the entire fleet); (2) more intensive maintenance of equipment, and more frequent and better cleaning of stations and vehicles; and (3) increasing the flexibility of the system through additional transfer connections, so that any station can be reached from any other station by the most direct path along the system (the success of the new pedestrian underpass under Bryant Park, which connects the 6th Avenue IND line to the Flushing IRT line, and is used by about 20,000 transfer passengers daily is a case in point; several other connections of this type are possible, and many would benefit low-income riders who are more likely to have unusual routes of travel). Improving transfers from the subway system to suburban railroads (specifically in Jamaica, now in progress, and in the South Bronx, which is not planned) is a related issue. (4) A radical improvement of the

underground station environment, initially, at least, at selected--the most rundown and most heavily used stations--but not limited to CBD locations and including poverty areas: this must include not only "cosmetic" treatment, such as new tile and better designed information signs, hardware, and more lighting, but structural changes as well--wider, shallower stairways off-sidewalk, open plazas at the mezzanine or platform level, skylights, lightwells and other openings to daylight and open air, which would make stations not only safer, more comfortable, and easier to use, but also psychologically inviting. There are many examples, including the Bryant Park underpass, to show that good design engenders respect for the environment, and reduces littering and other defacement. (5) Last but not least, reduction in travel time must be recognized as an explicit goal, and contemporary analytical techniques applied to the problem, to develop a specific set of investment priorities, line by line, for speed-increasing improvements, be they improved scheduling and routing, improved signalling, wider platforms and stairways to reduce delays in loading and unloading, or improvement at junctions and reduction in merging movements. The traditional lack of speed-consciousness and design-consciousness on part of the Transit Authority is only in the most recent years beginning to be overcome.

The bus network

Buses in the Region perform three rather different tasks, which can be treated under the headings: (1) local service; (2) express commuter service; and (3) school, charter and other special services. The latter are numerically important (they account for about 24 percent of all bus trips in the Region and provide most of the remaining profit to private operators), but will fall outside our purview here. Franchised bus operations in the Region started in 1905, as a complement to trolley cars, which were then the dominant mode of intra-urban travel. Gradually, however, mostly during the 'thirties and 'forties, trolley lines were abandoned and replaced by buses; in 1956, the last trolley car line in New York City was phased out. Even though initially one of the arguments in favor of buses was their greater flexibility, in fact most local bus routes in the Region, and especially in New York City, still follow the patterns of the streetcars they replaced, often constricted by legal franchises that hold on to historical precedent, and there has been

* Transportation Needs..., op. cit.

very little systematic effort to adjust them to present day travel patterns, or to present day latent demand. Only new bus routes from areas developed in the post-trolley car era have been introduced on this basis.

The bus routes generally cover the inner core of the Region, meaning in this case the four major boroughs of New York City, Hudson County, plus the inner portions of Staten Island, Union, Essex, Bergen, Passaic, Westchester and Nassau counties, in a fairly dense grid, with a spacing as close as 2,000 feet between lines in Manhattan and Central Brooklyn, more widely meshed--some 3,000 to 4,000 feet apart--in southern Brooklyn and in Queens, and still sparser as one moves outward. Beyond the core area, smaller old cities also have local bus networks focused on their respective Central Business Districts. In both cases, the extent of local bus use is generally confined to areas developed at residential densities in excess of 10 households per acre. Such areas typically generate over 5,000 person-miles of bus travel per square mile per day, which is a kind of threshold density of feasible bus service. Some rather sparse and infrequent service extends into areas with densities as low as 5 households per acre, but still lower densities, which account for the major part of the Region by area, cannot support bus service, except for widely spaced commuter routes to the Manhattan CBD, operated mostly from areas with poor rail service.

The 11,000 transit buses in the Region (one-fifth of the nation's fleet) carry an estimated 4.6 million passengers daily in regular service, or, as Table 67 shows, about 1.4 billion annually. About two-thirds of these trips occur within New York City, and the remainder are mostly accounted for by New Jersey. In the recent past, a generally downward trend has been evident on lines outside New York City, amounting to about a 2 percent decline annually; commuter lines to Manhattan from New Jersey registered an increase, especially on the longer-haul services. Within New York City, the pattern has been similar to that of subway use: generally stable since 1955, with a bulge in 1963-1965, and declines following fare increases that were, in percentage terms, more severe than those on the subway. Moreover, in poverty areas, bus use was declining even when the rest of the system experienced increases in patronage. Thus, between 1960 and 1965, eight routes traversing poverty areas in Central Brooklyn lost about 2 percent of their passengers while all other routes registered a 7.4 percent growth, as James Whittaker's study quoted earlier shows.

Table 67.
Bus Travel in the New York Region, 1967. Passenger Traffic (except school, charter, etc.)

Bus System	Average Weekday Passengers (millions)	Average Trip Length	Annual Revenue Passengers (millions)	Passenger Revenue	
				Regular Fare (\$ millions)	Total Operating ^a
MTA-NYCTA	1.43	n.a.	434.5	75.9	91.6
MTA-MABSTOA	1.3 ^c	n.a.	397.9	74.5	82.3
Private lines	0.4 ^c	n.a.	120.1	22.7	25.7
Total NYC	3.1^c	2.3^c	952.6	173.1	199.6
Rest of New York	n.a.	n.a.	61.7	17.8	24.2
New Jersey	n.a.	n.a.	326.5	109.6	133.4
Connecticut	n.a.	n.a.	54.7	14.5	16.8
Total Region^b	4.6^c	2.7^c	1,395.5	315.1	374.1

^a Includes revenue from charter operations, subsidies, etc.

^b Tri-State Regional Planning Commission definition, excluding 7 peripheral counties with a negligible number of bus passengers.

^c Regional Plan Association estimates.

Source: Tri-State Regional Planning Commission.

The average bus trip in New York City is local in nature and about 2.3 miles long. The commuter services are concentrated at the Port Authority Bus Terminal, with about 190,000 average weekday intra-regional trips (averaging an estimated 15 miles in length) and the Port Authority George Washington Bridge Bus Station, with 22,000 trips of much shorter length. Express bus lines within the City, initiated since 1968, carry close to 50,000 weekday trips. Together, these long-haul services, which account for only about 5 percent of all bus trips within the Region (but about a quarter of all bus travel) contribute to making the regional average bus trip somewhat less than 3 miles long. Thus, while bus trips in the Region as a whole virtually rival rapid transit trips in number, amounting to slightly under 13 percent of all trips, their contribution to total person-miles of travel is about half that.

Buses also emerge as the slowest mode of mechanically-powered travel: the average trip is made in 27 minutes, door-to-door, or at about 6 miles per hour. This speed is even less, close to the walking speed of 3 mph for the shortest trips in the 1 to 2 mile range, but does increase, on runs of over 10 miles, which are mostly express, to 15.5 miles per hour, which is actually a little better than the automobile can do at that distance.

Buses are an expensive way to travel. In 1970, Transit Authority operating costs worked out to 31 cents per subway passenger and 28 cents per bus passenger. Divided by the average trip length (about 6.7 miles on the subway, converting from airline distance, quoted earlier, to over-the-route distance), this meant 4.6 cents per passenger mile on the subway, and 12.2 cents per passenger mile on the bus. If one

takes the new express routes, which generally charge between 85 cents and \$1 for a trip that averages 15 miles, the cost comes to about 6.2 cents per passenger mile.

In 1970, it cost the Transit Authority about \$120 per 8-hour shift to operate a 50-seat bus (the cost to many private companies, with different labor agreements, was below \$100). The ultimate per mile cost to the rider, as in any other transportation conveyance, depends on two factors. (1) The speed, at which the vehicle is able to operate: thus, at 5 mph, the bus can produce 2,000 seat miles of capacity during that shift, while at 10 mph it can produce 4,000 seat miles. In the former case, a seat mile costs 6 cents, in the latter case, only 3 cents. (2) The load factor, which is the average proportion of the seats occupied throughout the day: squeezed in among standees during rush hours, one may be impressed with a 200 percent or greater load factor, but what may not be so apparent is that this is likely to occur only on part of the route, during a relatively short time. Long hours of operation over route sections where only a small proportion of the seats are occupied plus layover time at terminals can easily pull the average load factor down to 50 percent, in which case the slow ride costs 12 cents per occupied seat mile, and the fast one, 6 cents per occupied seat mile.

What does all this say for buses as a means of improving access from poverty areas to employment opportunities? First, it is clear that with their ubiquitous and multi-directional network, buses in New York City do represent an important transportation resource for the poverty areas. This is attested to by their relative "popularity" among the poor--they use them to the same extent as higher-income groups for the journey-to-work, despite the high cost per trip mile. Second, it is clear that exclusive express routes, over long distances, on which the same group of riders pays the full per mile cost, are out of reach for low-income workers. They would require a subsidy of over two-thirds of the fare, even if the economies of express operation are realized. Furthermore, even though the factory employment densities in New York City are higher than elsewhere in the nation (typical densities outside Manhattan are 80 workers per acre, of whom 20 or so may be bus users), it would be a formidable logistical undertaking to match particular groups of workers at employment sites with places of residence that they have in common, and arrange special bus runs along these routes. If routes are envisaged to completely new locations

that are 10 to 15 miles away, as some studies have suggested, there is no assurance that a significant number of low-income workers, with their 3-mile average trip length, would take them.

This is confirmed by the recent lack of success of attempting to do just that in Boston, St. Louis and Baltimore.

Rather, the solution is to start with the existing bus network, compare its routes to the routes poverty residents are actually taking, and in response to that, realign, combine, curtail or extend particular routes or groups of routes. In this process, economies of express operation can be enlisted by routing particular sections of bus lines, even though they run predominantly on local streets, on expressways and parkways. Generally, because the expressway network was built in the post-streetcar era, it is not nearly sufficiently utilized by buses in New York City. Furthermore, enhancing the existing system utilizes the economies of multiple use: essentially, the worker, who may travel a longer-than-average distance on an improved and extended bus route, will be subsidized by the short-distance rider, who is willing to pay the standard fare for perhaps a 1.5 mile ride, and capacity available off-peak is utilized by non-work trips which, as already pointed out, are more numerous in poverty areas because of low auto ownership. Throughout all of this, improvements should be focused on opportunities within a relatively short distance of poverty areas, because this is where most of the bus trips will end up.

Essentially, this approach was adopted by the Brooklyn Polytechnic Institute in its study of the Central Brooklyn Model Cities areas,* and is adopted in this report in the following chapter, with regard to three specific poverty areas in which travel patterns were investigated. A notable example of the success of such an approach, though not related to a poverty area, is the partial rerouting of the M-3 bus in Manhattan from its 49th-50th crosstown route, which terminated at the Hudson River, to the Port Authority Bus Terminal. There was here a large latent demand that did not fit the old streetcar grid, and was forced to use all kinds of inconvenient mode combinations for the diagonal trip. The change was initiated by the Tri-State Regional Planning Commission as part of a U.S.

* Transportation Needs of Residents-Central Brooklyn Model Cities Area. Polytechnic Institute of Brooklyn, April, 1971.

Department of Transportation Urban Corridor Demonstration Program.

Lastly, as with the subway system, amenities are important, and much less costly in this case: continued upgrading of equipment, more convenient equipment design (for example, windows that are at eye level of standees), more extensive use of information signs and route maps at stations, shelters for inclement weather, stricter enforcement of on-schedule performance (reduction of "bunching" or platooning), and so on.

Automobiles and expressways

As becomes clear--by inference--from the preceding discussion, most of the travel in the New York Region is by automobile; moreover, all of the growth in intra-regional travel is accounted for by automobile travel. Tri-State Regional Planning Commission estimates suggest that in the Tri-State Region (which covers 96 percent of the population of the Region as used in this report), the daily number of trips by mechanized modes increased from 30.8 million in 1960 to 38.0 million in 1970. If about 11 million of these were trips by public transportation, and would have stayed constant during the period, the share of public transportation trips would have dropped from about 36 percent of all trips in 1960 to 29 percent in 1970. In reality, public transportation ridership has declined slightly in absolute numbers as well, mostly due to the sudden drop in subway ridership in 1970, and to the long-term decline in local bus passengers outside New York City. Thus, the contrast between 1960 and 1970 is greater unless one takes into account the increase in trips on school buses. In any case, over 70 percent of all trips in the Region today are by auto.

New York City's dependence on the automobile is obviously much smaller than that of the Region as a whole. As we have shown, in 1960, only 20 percent of the workers residing in New York City used auto to work, as against 44 percent in the Region as a whole. The 1970 Census journey-to-work data are not available at this writing, but 1970 data from the survey of three poverty areas described in the following chapter indicate that in these particular areas, 40 percent of all resident workers travelled to work by auto, which certainly shows a very strong dependence of poverty areas--particularly those with less than average access to the subway system--on the automobile.

With regard to trips for all purposes and the City as a whole, one can estimate that in 1970 over one-third of all mechanical trips by residents were made by auto. This amounts to about 3.1 million vehicle trips, or 4.5 million person-trips daily, the same number as by subway. Of course, these trips are much more evenly distributed in space and in time, and not so heavily focused on Manhattan. In fact, less than 10 percent of them had destinations in the borough of Manhattan in 1963. Again, subsequent data in Chapter 5 suggest higher 1970 proportions from the low-income areas studied.

It is well established that the number of trips made by automobile depends primarily on the number of automobiles available; secondarily, it depends on the surrounding density of development or, which is a related factor, the amount of roadway space available. Tri-State Regional Planning Commission has shown that in 1963, the average automobile in New York City made 2.0 trips per day, as opposed to the developed part of the Region outside New York City, where the number was 3.7. Converting from airline to over-the-road distance, the length of the average auto trip was 8.0 miles in the City versus 7.0 miles outside, but because of fewer trips per auto, the vehicle miles of travel per auto on a weekday were 16 in the City versus 26 outside. There is evidence that the number of trips per auto is a fairly stable figure, although outside New York City it does decline somewhat as the number of autos per household increases.

This dependence of auto travel on the number of vehicles available makes motor vehicle registration a good indicator of auto travel. Table 68 provides an historical overview, comparing the City of New York to the rest of the Region. It is evident that in the past, in times of prosperity, the percapita auto registration rate in New York City was exactly half that of its environs. In the most recent decade, however, the automobile growth rate in the City has slowed down more than in its environs, and in 1970, the City's registered autos percapita were only 43 percent of the suburban ones. This may be attributable to the relative worsening of the City's economic position in the Region, portrayed in Chapter 3. Nevertheless, in the past decade, the number of autos registered in the City did increase by 15 percent, and one can assume a commensurate increase in auto travel. In the environs, of course, spurred on by population growth, the increase in autos registered was close to 50 percent.

Table 69 breaks down the growth of motor vehicle and auto registrations over the past decade by borough within New York City, and by sectors of the Region in its environs. Within the City, the largest increase was recorded in the two lower-density, upper-income boroughs of Queens and Staten Island, which had the highest auto ownership rates to begin with. However, adjusting for changes in population, that is on a per-capita basis, the increase in auto registrations was similar in Manhattan, Brooklyn, the Bronx, and Queens: the ratio of autos per population increased on the order of one-tenth. This increase was relatively lower in the Bronx and in Brooklyn, relatively higher in Manhattan and Queens, but on the whole there was a noticeable increase in auto availability to the City's residents even in these high-density boroughs, and a share of this increase is accounted for by the lower income population. On Staten Island, the increase on a percapita basis was dramatically higher and compares to that of the suburban counties.

It is also evident from Table 69 that total motor vehicle registration growth outpaced passenger re-

gistrations in Brooklyn, the Bronx and Queens, while in Manhattan total registrations suffered a decline. This is mostly due to the decentralization of commercial registrations from Manhattan, in line with its decline of manufacturing and warehousing activity. Outside New York City, the growth of total registrations outpaced auto registrations very slightly on the average, but there is a noticeable shift in commercial registrations away from the Long Island sector toward New Jersey, indicative of the latter's growing role in manufacturing and warehousing activities.

The degree to which a motor vehicle is used depends, as we have pointed out, to some degree on the availability of roadway space. Quite obviously, a vehicle registered in New York City has relatively little street space available to it. The City has about 400 registered vehicles for every mile of roadway, as compared to about 100 per mile outside the City. Of particular importance for moving vehicles are limited-access highways or freeways (expressways, parkways and toll roads). As Tri-State Regional Planning Commission has shown, freeways, which accounted for

Table 68.
Motor Vehicle and Automobile Registrations, New York Region (31 Counties), 1920-1970.

	Motor Vehicles (000's)			Automobiles (000's)			Persons Per Motor Vehicle			Persons Per Automobile		
	Region	NYC	Environs	Region	NYC	Environs	Region	NYC	Environs	Region	NYC	Environs
1920	543	223	320	389	150	239	18.5	25.2	13.8	25.7	37.4	18.4
1930	2,111	764	1,347	1,724	597	1,127	6.0	9.1	4.2	7.3	11.6	5.1
1940	2,745	995	1,750	2,361	840	1,521	4.9	7.5	3.5	5.7	8.9	4.0
1950	3,878	1,351	2,527	3,338	1,164	2,174	3.9	5.8	2.9	4.5	6.8	3.3
1960	5,505	1,540	3,965	4,906	1,365	3,542	3.2	5.1	2.5	3.6	5.7	2.8
1970	7,703	1,763	5,940	6,857	1,570	5,288	2.6	4.5	2.0	2.9	5.0	2.2

Source: Regional Plan Association.

Table 69.
Change in Motor Vehicle and Automobile Registrations, 1960-1970.

	Motor Vehicles ^a (000's)			Passenger Automobiles (000's)			Ratio Cars per 100 Population		
	1960	1970	% Change	1960	1970	% Change	1960	1970	Increment
New York City	1,540.4	1,762.6	+14.4	1,364.5	1,569.6	+15.0	17.5	19.9	+2.4
Manhattan	241.1	230.7	- 4.3	174.8	175.9	+ 0.6	10.3	11.4	+1.1
Brooklyn	479.9	519.6	+ 8.3	435.5	468.6	+ 7.6	16.5	18.0	+1.5
Bronx	231.0	265.2	+14.8	219.7	242.6	+10.4	15.4	16.5	+1.1
Queens	511.8	633.6	+23.8	472.4	577.3	+22.2	26.1	29.1	+3.0
Staten Island	68.6	113.5	+65.5	62.0	105.3	+69.8	27.9	35.6	+7.7
Environs	3,964.5	5,940.3	+49.8	3,553.4	5,287.7	+48.8	36.1	44.6	+8.5
Long Island	839.5	1,335.0	+59.0	748.9	1,197.0	+59.8	38.1	46.8	+8.7
Northern NYS	642.9	923.7	+43.7	556.9	813.8	+46.1	37.1	44.7	+7.6
New Jersey	1,872.1	2,799.0	+49.5	1,687.0	2,493.7	+47.8	34.1	43.0	+8.9
Connecticut	610.0	882.6	+44.7	560.6	783.2	+39.7	39.1	46.6	+7.5
Region Total (31 counties)	5,504.9	7,702.9	+39.9	4,917.9	6,857.3	+39.4	27.9	34.7	+6.8

^a Includes, in addition to passenger automobiles, "commercial vehicles" (incl. trucks), plus buses, taxis, and motorcycles, rent-a-cars are listed under taxis in New York State, under passenger cars in New Jersey and Connecticut.

Source: Regional Plan Association and Tri-State Regional Planning Commission.

only 2.5 percent of the total road and street mileage in the densely built-up portion of the Region in 1963, carried 30 percent of all vehicle miles of travel. Arterials, constituting 15.5 percent of the mileage, carried another 47 percent, and some 82 percent of the street mileage, local in nature, carried only 23 percent of the vehicular travel. Freedom from interruptions in flow leads to lower operating cost, higher capacity and higher speed. In 1963, arterial streets operated at an average speed of about 10 miles in Manhattan and 16 to 18 miles per hour in the other boroughs (except Staten Island, with 24), whereas speeds on freeways ranged from 33 in Manhattan to 39 miles per hour in the Bronx. Clearly, the extent of mobility one gains having an automobile depends on one's access to the freeway system, for even during periods of congestion, freeways usually offer the "least cost" path.

Table 70 offers an historical overview of the evolution of the freeway system in New York City, compared to the rest of the Region. The construction of limited-access highways in North America originated in the New York Region in the late 'twenties, and until 1950, the Region had more freeway mileage than the rest of the United States. In New York City, about half the present 210 miles was built before 1945, and though much of it was subsequently reconstructed, portions exhibit symptoms of aging similar to those of the subway system. Periods of the most intensive construction activity in the City were 1935-1940, 1950-1955, and 1960-1965; between them, the typical rate of construction was 2 to 3 miles annually, and the most recent 5-year period is one of such a slowdown, occasioned by controversies over route location and over the need for expressways as such. It is notable that outside New York City, the construction rate is also the slowest since 1950.

In a geographically limited urban area, the expressway system cannot expand forever: with 210 route miles in a City that contains 320 square miles of land, the network is already fairly dense. Yet, it is just as true that the service provided by that network is rather uneven, and while some sections of the City cannot accommodate and do not need any more freeways, others are grossly underserved. Table 71 shows various indicators of freeway service by borough within the City, and by sectors of the Region outside the City for comparison. Lane miles (a better measure of highway capacity than route miles, because it takes width into account) per 1,000 motor vehicles registered is one such indicator. It shows

Table 70.
Road and Freeway Mileage in the New York Region.

Year	Total road mileage (State, County, Municipal)					Annual Rate of Construction	
	New York City	Rest of New York	New Jersey	Connecticut	Total	NYC	Outside NYC
1960	4,346.0	25,739.2	18,720.9	8,438.5	57,244.6		
	Freeway mileage, 1926-1971 (Highways of 4 or more lanes with fully controlled access)						
	New York City	Rest of New York	New Jersey	Connecticut	Total	NYC	Outside NYC
1927	1.6	1.0	1.0	—	3.6	2.4	9.4
1930	9.7	35.4	2.0	—	47.1	3.2	16.9
1935	25.7	111.2	10.5	—	147.4	14.0	20.5
1940	96.2	163.3	20.5	40.0	320.0	3.1	2.7
1945	111.9	171.5	20.5	45.0	348.9	1.6	17.0
1950	119.9	213.5	37.5	71.0	441.9	6.0	69.3
1955	149.8	377.0	217.6	74.0	818.4	2.7	46.5
1960	163.3	477.3	266.5	157.5	1,064.6	7.5	50.2
1965	201.0	601.4	323.5	227.0	1,352.9	1.7	44.1
1971 ^a	210.5	751.0	402.5	241.0	1,605.0		

^a As of July 1st.

Source: Regional Plan Association.

that the City is about one-quarter below the regional average of 1 lane-mile per 1,000 vehicles, and not too much worse off than New Jersey or Long Island. The Bronx, by that standard, has the best service, and Manhattan, Queens and Staten Island are above the City average. Brooklyn, by contrast, is at half the average level. This standard, clearly, does not consider the possible influx of traffic from the outside, by vehicles that are not registered in the same borough. To take that into account, the sixth column shows the percent of all vehicle miles of travel in the area which is carried by freeways, as opposed to arterial or local streets. Again, the Bronx comes out on top, together with Queens, and Brooklyn on the bottom; the Staten Island network was not in operation when the data in this column were assembled.

The Bronx and Manhattan also come out on top by such simple indices as freeway route miles per square mile of built-up land, or total land area within 1 mile of expressways. Brooklyn comes out on the bottom on both accounts, if construction presently under way on Staten Island is taken into consideration. The unserved area of Brooklyn, more than 1 mile from any expressway, is graphically portrayed earlier on Map 8. It is evident that most of the Central Brooklyn and East New York poverty area is not easily accessible to expressways, and the industrial areas in Maspeth, Queens and in the Flatlands in southern Brooklyn have likewise poor access. Harlem and the South Bronx have good highway access, in line with the favorable position of their boroughs, but in Queens, the largest

Table 71.
Freeway Service in the New York Region.

	Freeway Route Miles, 1971	Freeway Lane Miles, 1971	Lane Miles per 1,000 Motor Vehicles	Route Miles per Sq. Mile Built-up Land ^a	Percent Area Served by Freeways ^b	Percent VMT on Freeways, 1963	Fatalities per 100,000,000 VMT, 1964	
							Freeways	Non-Freeways
New York City	210.5	1,266	.72	1.5	84	40^c	1.6	3.1
Manhattan	33.5	204	.88	2.6	100	43	1.0	13.0
Brooklyn	34.5	207	.39	1.0	68	30	2.1	11.0
Bronx	44.0	267	1.01	2.5	100	47	2.8	14.1
Queens	80.5	490	.77	1.5	90	47	1.3	5.2
Staten Island	18.0	98	.86	.9	75			2.8
Environs	1,394.5	6,967	1.17	.7	n.a.	26^d	—	—
Long Island	240.5	1,264	.95	.7	n.a.	30 ^d	1.5	4.6
Northern N.Y.S.	510.5	2,258	2.44	1.8	n.a.	43 ^d	3.4	4.8
New Jersey	402.5	2,310	.83	.6	n.a.	19 ^d	2.0	4.3
Connecticut	241.0	1,135	1.29	.6	n.a.	31 ^d	2.5	3.0
Region Total (31 counties)	1,605.0	8,233	1.06	.8	n.a.	30^d	2.1	5.4

^a Built-up land includes all land in lots with buildings, exclusive of streets, parks, etc.

^b Area within 1 mile of freeways, existing or under construction.

^c Probably over estimated, due to under-assessment of travel in the CBD.

^d Only within Intensively developed area, excluding outer counties and parts of counties.

Sources: Regional Plan Association and Tri-State Regional Planning Commission.

"hole" in the freeway grid includes the poverty area of South Jamaica. Thus, while we have found that poverty areas have better than average access to the subway system, we also find that they have worse than average access to the freeway network.

Plans to complete the City's freeway system--now deferred--which would have included the Brooklyn-Queens Interboro expressway, the Cross-Brooklyn expressway, and the completion of the Clearview Expressway near Jamaica, for a total of about 20 miles, plus about 10 additional miles on Staten Island, which do not affect poverty areas, would largely fill all the "holes" in the network, affording, among other things, unserved poverty and industrial areas the same standard the rest of the City has.

Of course, for the low-income worker to be able to use the mobility offered by freeways, auto ownership by him should not be discouraged. A clear distinction must be drawn between selective policies, aimed at discouraging or even preventing auto use in areas where high automobile concentration is environmentally harmful, such as the Manhattan Central Business District, pedestrian precincts in residential areas, or parks and nature preserves, and indiscriminate policies which make it more difficult to operate an automobile in general, regardless of purpose. A moratorium on all expressway construction, poor street pavement maintenance, or the proposal of a general tax on automobiles in the City hurt the poor as well as the well-to-do. For, with present economic trends, the automobile will increasingly become the

poor man's mode of travel, with rapid transit increasingly shifting toward those better off.

In 1970 prices, the direct operating cost of an automobile (gas, oil, tires and routine maintenance) can be calculated at about 4.5 cents per mile. Assuming roughly 6,000 miles of travel per car annually in the City (as opposed to about 9,500 in its environs) the operating cost comes to only \$270 annually. However, added to that must be the fixed costs, consisting mostly of insurance and depreciation. For a married male driver 25 years old, basic bodily injury and property damage insurance in Manhattan amounts to about \$360 annually (about 25 percent more if he is unmarried, less if he is older). This does not include optional forms of insurance, such as fire, theft or collision. Interest and depreciation on a three-year old used car amount to less than that, about \$300. With an allowance for repairs, the total annual cost is on the order of \$1,000 or 15 percent of the average low-income worker's wages before taxes.* This comes out to some 16.7 cents per vehicle mile or, given an average occupancy of 1.4, about 12 cents per passenger mile, more than the subway but about the same as the local bus. The assumption is that the worker does not incur any costs of garaging, parking, and does not use toll facilities on a daily basis; adding

* This compares to a national average expenditure of 8 percent of the household income of an employed head of household in 1970.

the latter two could easily add another \$500 per year or 8 cents per mile.

This analysis suggests several things. First, it explains why in the equations dealing with choice of mode that were presented earlier auto operating cost plays no role at all, but tolls and parking charges do. They are a potent instrument for increasing total auto operating cost by 50 percent or more; fortunately, they can do this on a selective basis, and thus direct auto travel away from areas where it causes high social costs--if society chooses to use them in this manner. Second, it shows that in New York City insurance rates are a major deterrent to wider auto ownership; the figure above is calculated for Manhattan, and is somewhat lower in the other high-density boroughs; however, in areas immediately outside the City, it is 30 to 40 percent lower. Third, it shows that the cost of the automobile itself tends to be about one-third of the total cost of owning and operating one. This is not much lower for a used vehicle than for a new one, as Sumner Meyers has shown in his "Personal Transportation for the Poor"*; a new inexpensive but durable small foreign car, such as the Volkswagen is shown by him to incur a repair and maintenance cost about 50 percent lower, as well as a 20 percent lower capital cost. Recent figures published by the American Automobile Association** show that the direct operating cost of a domestic compact car is about 18 percent lower, and that of a foreign compact, 42 percent lower than that of a standard new domestic car. Annual fixed costs (which in the AAA example include complete insurance coverage) are, respectively, 19 percent and 40 percent lower. The barrier to realizing these savings by the low-income worker is the high initial investment needed for a new car, and his difficulty in obtaining sufficient credit.

Clearly, if auto ownership by the poor is to be encouraged, the prime levers are cooperative arrangements to reduce insurance costs and the costs of the initial down-payment on economical new cars that will eventually yield much more transportation for the same cost as a jalopy, so typical of low-income areas.

* "Personal Transportation for the Poor", by Sumner Meyers, American Academy of Arts and Sciences, Transportation and Poverty Conference proceedings, June 1968.

** "Your Driving Costs", American Automobile Association, 1971.

Accessibility and economic status

We have thus surveyed travel behavior and found that the poor travel less than the well-to-do, in terms of frequency of trips, their distance, and their time; they also have less choice with regard to the mode of travel. All this can be, and has been, interpreted as a handicap to the improvement of their economic status. On the other hand, it is also true that the location of jobs in which lower-income workers are employed is such that most of them are either accessible to the low-income areas via the Manhattan-oriented subway system, or else are within, or contiguous to the low-income areas themselves, and thus within a short bus or even walking trip.

An effort was made to explore the degree to which better access is reflected in better economic status. An exploration like that cannot be easily performed across all income groups, because the distribution of the highest income group is bi-polar: they either live at the place of maximum accessibility to their jobs, within the Manhattan Central Business District and in a few adjacent areas, or else they live in places of very low accessibility on the periphery of the City and in the suburbs. Besides, accessibility to high-income jobs is of very little relevance to low-income workers. Therefore, only accessibility to low-skilled and semi-skilled jobs was measured. Accessibility is here defined as the sum of products of a travel time function from a place to all other places, and the employment at these places. The travel time function is the low-income function, derived empirically from travel behavior in the Region, and presented earlier in Chart 9. The travel time it was applied to is travel time via the rapid transit network. The "places" were postal zones within New York City having a significant concentration of workers in the "operative" and "laborer" categories, as well as all zones with more than 30 percent of the resident households earning less than \$3,000 annually in 1966. Accessibility and income for these postal zones were related statistically by means of correlation analysis. The result is shown in Chart 29.

The chart shows that as transit accessibility to low-income jobs rises, so does poverty. The relationship, the opposite of what one might expect, is not very strong, but has a 95 percent probability of being significant, i.e. not due to chance.

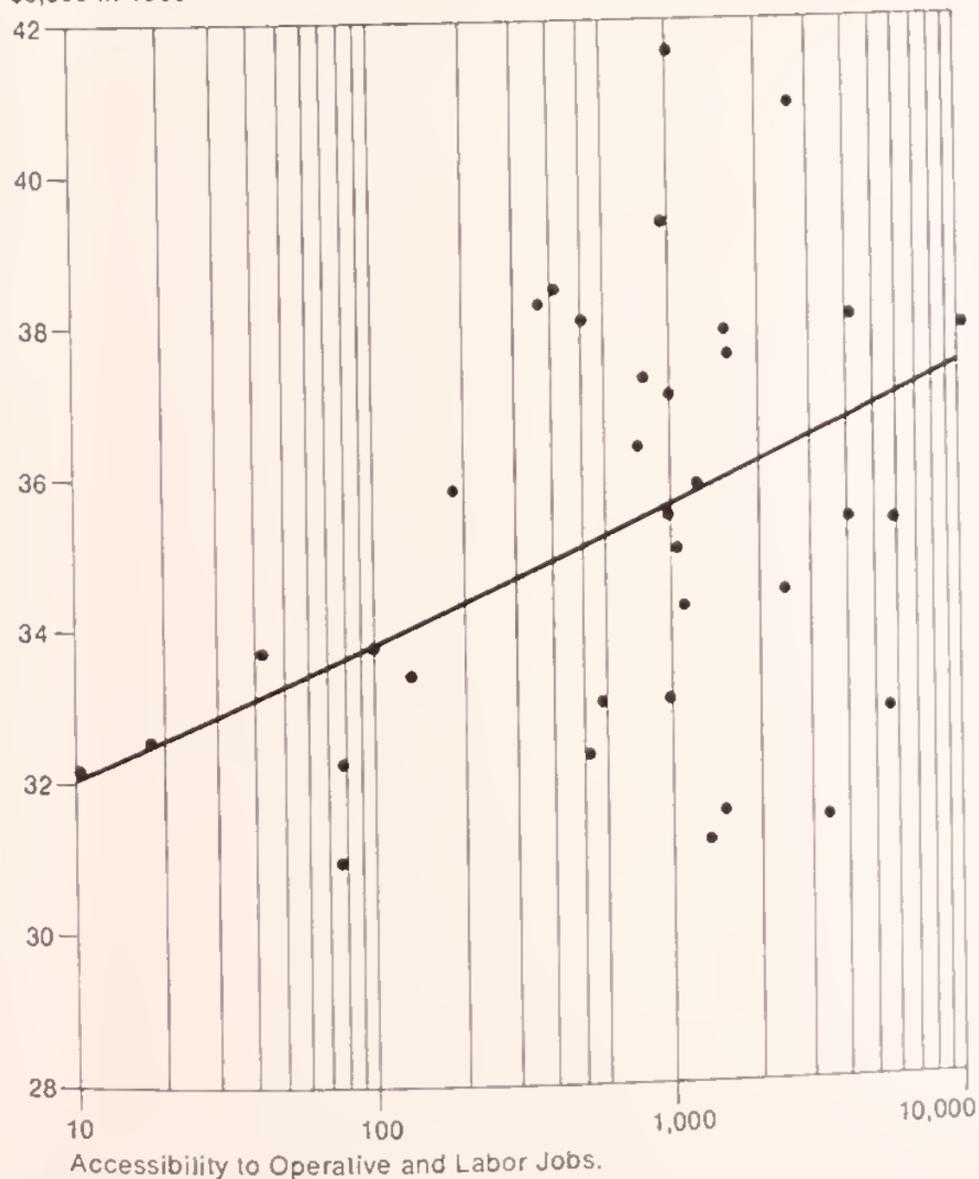
Earlier in Chapter 2 we have also found that as accessibility to the transit system increases, so do job openings; the more accessible plants pay lower

wages. It appears that the locations of poor workers and of low paying jobs tend to seek a balance; the existence of a large, accessible labor pool permits the survival of many low-wage employers who can pay high rents for accessible sites only because there are so many low-income workers around. Conversely, residential densities in low-income areas are so high that even though percapita income may be low, the aggregate income per square mile is high, and so is the aggregate rent for a high-accessibility location.

We thus see a self-reinforcing relationship created, in part, by good accessibility of a particular type of labor pool to a particular type of job. The transportation strategy to be pursued under such circumstances is not merely to etch deeper those transpor-

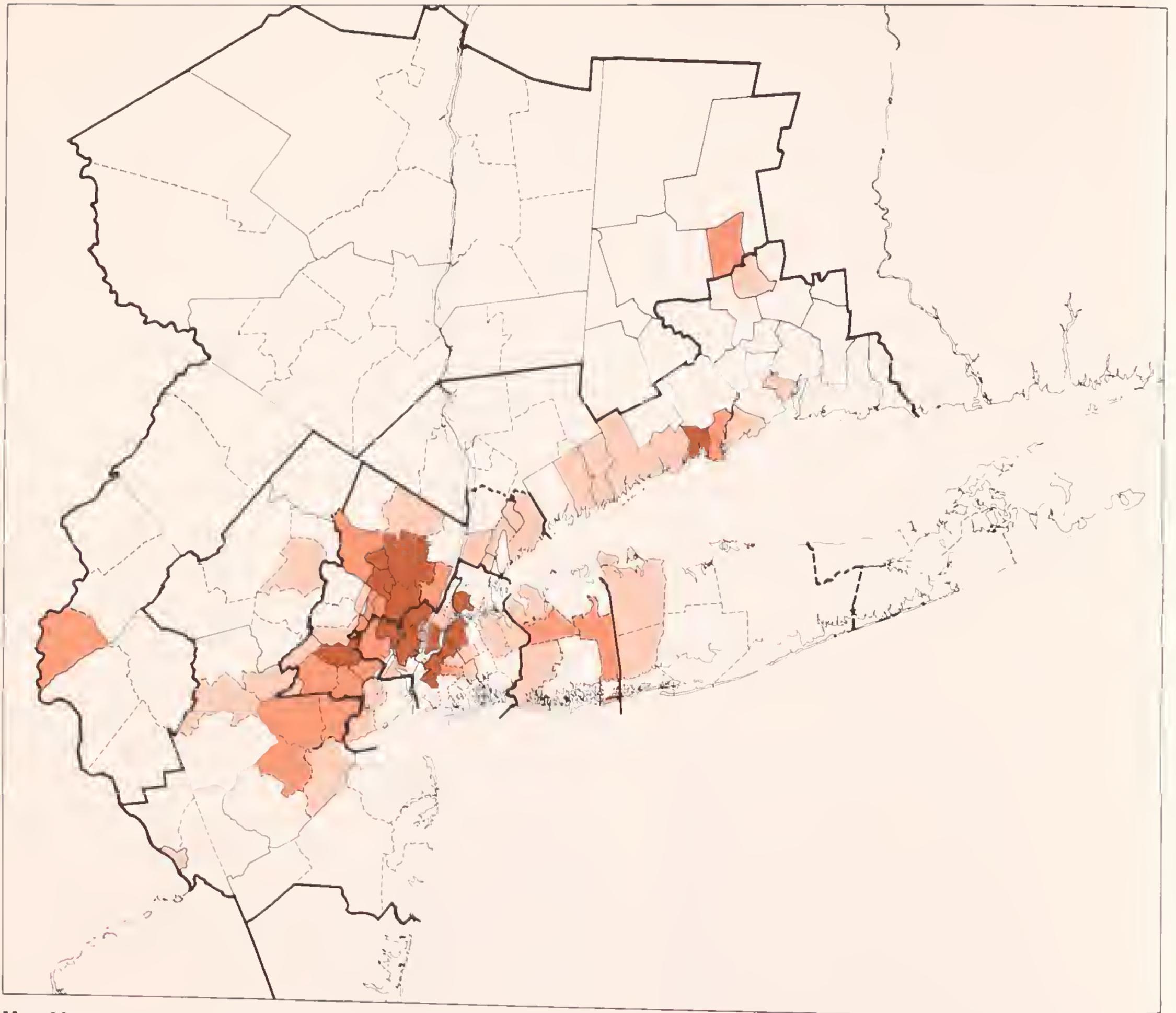
Chart 29
Accessibility to Low-Income Jobs vs. Income by Postal Zone.

Percent of Income
Tax Returns Under
\$3,000 in 1966

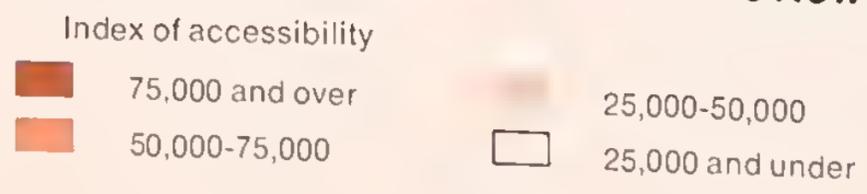


tation channels that are already deeply etched; this can be helpful in its own right, to the extent that unnecessary loss of time and money by low-income workers can be prevented. However, this will not provide higher paying jobs. To improve the likelihood of the latter, a greater number of options for travel to work must be provided. For example, from South Jamaica, one should be able to go by bus to both Kennedy Airport and Flushing, not merely to the Jamaica Central Business District. From Central Brooklyn, subway access should be not just to the Garment District of Manhattan and to Downtown Brooklyn: access to Long Island City and to Bush Terminal can be made more convenient. The George Washington Bridge Bus Station, an important gateway to New Jersey, should be easily accessible from East Harlem, not just from West Harlem. The option of using the commuter railroads should be available to those living near them, and the option of using the auto for travel to dispersed destinations should not be discouraged.

Map 23 at the end of this chapter shows the accessibility to production jobs in manufacturing and warehousing for the Region as a whole. The middle-income propensity curve from Chart 9 is used in this case to deflate travel time, and travel time, in turn, except for the core of New York City, is travel time by auto. It is clearly apparent from the map that in the regional picture, there is a tight island of accessibility to production jobs which is centered on the Manhattan Central Business District and the Brooklyn to Long Island City waterfront. The major poverty areas we discussed are located toward the outer edges of this island. Beyond it is a band of poor accessibility to production jobs--the outer Bronx, the middle-income areas of Queens. Still beyond it is the huge area of production job opportunities in New Jersey, particularly in Bergen County, and smaller, but significant areas through central Nassau and western Suffolk counties, through southeastern Westchester, and in Connecticut beyond Greenwich. These can be viewed, in their closer-in parts, as target areas for reverse commuting by bus or rail and auto, and also as appropriate locations for low-income housing outside New York City.



Map 23
Accessibility to Production Jobs in the New York Region



CHAPTER 5. THREE CASE STUDY AREAS

To determine the suitability of various transportation additions or improvements for travel to work it is necessary to know the characteristics of the potential users of the transportation service as well as their present patterns of travel. This can best be achieved by detailed questionnaires conducted on a sample basis.

As was pointed out earlier, the 1960 Census journey-to-work data, though based on a 25 percent sample, provide no origin-destination detail within the boroughs of New York City. The simulated data quoted earlier, useful for assessing City-wide patterns, are not sufficient for evaluating improvements at the community level. The 1963 Tri-State Regional Planning Commission Home Interview survey does provide geographic detail by square mile, and a variety of data on travel characteristics, but, based on a 1 percent sample, is also more suitable for dealing with areawide aggregates. Besides, neither of these sources was directed at studying poverty areas as such, and both are now somewhat out of date. Consequently, a home interview survey was conducted in 1970 in three selected poverty areas of New York City, based on an 8 percent sample.

Its purpose was fourfold. First, to find out who the people living in the selected areas are, their present work status, education, age, and income distribution and other details that could relate to work and the work trip. Second, to find out how people use the present system for travel, where they work, how they get there, and how much time and money they spend in doing so. Third, to allow us to formulate transportation improvements based on detailed data at the local level. Fourth, to provide a basis for suggested improvements in other low-income areas within the City without incurring the prohibitive costs of sampling all of them.

Selection of the Study Areas.

It was determined early that resources permitted the detailed study of three distinct areas. Six criteria were used in selecting them:

1. They should have many poor persons living in them.
2. They should have significant transportation problems.
3. They should not have been the subject of similar studies recently.
4. They should be representative of larger areas to allow the conclusions reached there to be applicable to the larger areas.
5. They should be sufficiently separate physically, so as to provide sufficiently distinct areas and perspectives.
6. The population densities of the three areas selected should be significantly different from one another since population density largely determines the feasibility of public transit.

With respect to the first and second of these, Map 24 shows which low-income areas (using percent of population on welfare) have poor access to the mass transit system (defined as being beyond two thousand feet from a transit station). With respect to the third criterion, previous studies, the transportation needs of the Central Brooklyn Model Cities area (see Map 20) have been examined by the Polytechnic Institute of Brooklyn and the possibility of serious overlapping should be avoided. Consequently, following the first three criteria, Table 72 was prepared, with Central Brooklyn zones excluded, showing in rank order of mass transit coverage, each health zone with thirty percent or more of its population receiving welfare. There is a wide variation in subway coverage among the zones but a very narrow variation of welfare dependence and the proportion earning less than \$3,000. In other words, we can select study zones rather free-

Table 72.
Low-Income Areas Considered for Detailed Study.

Borough	Health Area	Percent Mass Transit Coverage	Percent Welfare	Percent Incomes Below \$3,000	1970 Population	Population Density
Queens	34,35.1 ^a	10%	30.2%	33.8%	30,540	19,200
Manhattan	67	15	39.2	30.2	14,906	207,000
Bronx	20.0	25	35.6	33.1	31,070	134,000
Brooklyn	34	45	33.3	38.3	33,300	91,000
Bronx	19	50	30.3	32.3	24,260	130,000
Manhattan	26	55	31.0	35.9	24,165	115,000
Manhattan	21	60	33.7	35.9	25,066	104,500
Bronx	21.2	80	34.9	33.1	16,465	128,600
Bronx	26	90	30.7	33.5	28,537	117,000
Manhattan	25	90	31.0	35.9	16,684	151,800
Brooklyn	62	95	33.5	29.3	26,730	74,000
Bronx	21.1	95	30.5	33.1	11,095	48,000
Bronx	44	100	33.2	36.4	16,541	152,900
Bronx	29	100	32.9	38.5	25,729	142,900

^a Health area 34 in Queens, unlike the other health areas in this table, is extremely heterogeneous in its income character. Consequently, the northern half of health area 34 in Queens was used here and extended to the east to coincide with postal zip 11433, resulting in a more homogeneous area.

Source: Regional Plan Association.

ly on the basis of mass transit coverage alone. With that in mind it is apparent that the first seven areas listed in Table 72 have substantially poorer access than the rest. The first impulse is merely to select the three that head the list.

However, other circumstances should be considered. Manhattan health zone 67 on the lower East Side has a small population and is physically close to the Central Business District. The zone in Jamaica, Queens is remote and it does have almost three times as many people as the Manhattan zone; it also has the advantage of being prototypical of relatively low-density areas. Health zone 34 in Brooklyn invites the danger of overlap with the Polytechnic Institute of Brooklyn study, because it is adjacent to the Model City area, but it is difficult to ignore Brooklyn entirely with its vast expanse of poverty. Health zones 19 and 20.0 in the Bronx are contiguous, making a study area nestled between two subway lines, and with a total coverage of less than 50 percent.

After weighing all these facts the Queens and Brooklyn zones were selected for detailed analysis along with the combined areas of zones 19 and 20.0 in the Bronx. These three meet all of the criteria mentioned earlier. Their population is poor, their access to mass transit is poor, their transportation needs have not been studied, they are prototypical of larger areas of poverty, they are widely separated geographically and their population densities are considerably different from one another. From this point on, these three areas will be referred to as South Jamaica (Queens), Bushwick (Brooklyn) and East Tremont (The Bronx).

Table 73.
Low-Income Areas Selected for Detailed Study.

Area	Percent Mass Transit Coverage	Percent Welfare	Percent Income Below \$3,000	1970 Population	Population Density
1. South Jamaica	10%	30.2%	33.8%	30,540	19,200
2. Bushwick	45	33.3	38.3	33,300	91,000
3. East Tremont	37	32.9	32.7	55,330	132,000

Source: Regional Plan Association.

Existing transportation service.

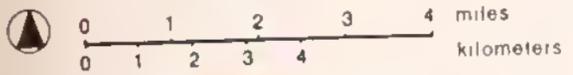
South Jamaica, as defined by this study, consists of postal zip 11433, bounded on the north by Jamaica Avenue, on the east by the tracks of the Montauk Branch of the Long Island Railroad, on the south by Linden Boulevard and Murdock Avenue and on the west by Sutphin Boulevard and 150th Street.

The area is zoned mostly for low and medium-density residential use south of South Road, with industrial and commercial zoning to the north. For a detailed description of the area's history, population and housing characteristics, reference should be made to South Jamaica Community Development Study, Hoberman & Wasserman and Plan for New York City, 1969, A Proposal, Volume 5: Queens, New York City Planning Commission.

South Jamaica's rapid transit service (see Map 28) includes two lines, the Jamaica Avenue BMT elevated along Jamaica Avenue and the Independent line along Hillside Avenue. The BMT elevated runs along the northern edge of the study area, starting at 168th Street and stopping at 160th Street and at Sutphin Boulevard as it heads westward to Brooklyn and Manhattan. Two services are provided on the BMT line: the

Map 24.
Selection of Case Study
Areas

-  Areas within 2,000 feet of a rapid transit station
-  Health Areas with more than 30 percent of the population on welfare
-  Health Areas



KK train serving Midtown Manhattan, eventually terminating at Sixth Avenue and 57th Street; and the QJ train serving Lower Manhattan, Brooklyn, and eventually terminating in Coney Island. The KK service and the QJ service beyond Broad Street in Lower Manhattan are provided only during the peak periods. The ride to 42nd Street and Sixth Avenue from 168th Street on the KK has a scheduled running time of 30 minutes during peak periods. Headways are 6 minutes. QJ trains are scheduled for 44 minutes from 168th Street to Broad Street and also run on 6 minute headways.

The Independent line along Hillside Avenue, some 2,000 feet north of the study area, provides two services through Queens to Manhattan, the E and the F trains. Both serve Midtown Manhattan, scheduled for 35 minutes to 42nd Street during peak periods: the E to Eighth Avenue, the F to Sixth Avenue. The E train is scheduled for 46 minutes to Hudson Terminal, site of the World Trade Center. Both provide about 3.5 minute headways during the peak periods. Both eventually go to Brooklyn, the E train continuing on to Rockaway and the F train to Coney Island. Hillside Avenue stops, in the vicinity of South Jamaica, are at 169th Street, Parsons Boulevard and Sutphin Boulevard.

The study area is generally beyond a reasonable walking distance to these services; only about 10 percent of the area and even a smaller proportion of the population is within 2,000 feet of Jamaica Avenue. No part of the study area lies within that distance from Hillside Avenue.

The bus service is characterized by a series of lines running north-south through the study area along Sutphin, New York and Merrick Boulevards and terminating at Jamaica or Hillside Avenues. Aside from those two Avenues, east-west service is all but nonexistent, with some service along parts of South Road and Liberty Avenue. Other lines come from north of Hillside Avenue with their southern terminals at Hillside or Jamaica Avenue or from Nassau County to the east. The New York City Transit Authority provides one route, the Q60, that runs to Manhattan via the Queensboro Bridge. Aside from the Transit Authority, five private bus companies provide this network of service: Green Bus Lines, Inc.; Jamaica Buses, Inc.; Queens Transit Corporation; Sehenk Transportation Co. Inc.; and Bee Line, Inc. The latter two are franchised for trips between Queens and Nassau counties and cannot serve intra-Queens travelers. Bus headways during the peak periods range from 2

minutes and up for bus routes wholly within the City and 10 to 15 minutes for routes between Jamaica and Nassau County. Off-peak frequency varies widely by route and is often 15 minutes or more. Fares are 30 or 35 cents for buses within the City. Bus fares to Nassau County are zoned ranging from about 30 cents at the County line to 60 cents to Roosevelt Field. Free transfers are limited to routes of the same operator.

The bus network is designed to serve primarily as a feeder to the two rapid transit lines and to the retail center along Jamaica Avenue. There is virtually no bus service extending through the study area that continues on north of Hillside Avenue. As we shall see later, this results in numerous circuitous routes, time-consuming trips and multiple fares.

All scheduled service of the Long Island Railroad stops at the Jamaica Station at Sutphin Boulevard and Archer Avenue, just outside the study area. As many as seven trains serve such close-in Nassau County locations as Mineola or Freeport during the reverse commutation peak periods with generally fewer trains serving prospective locations to the east. Running time to Mineola from Jamaica is only 14 minutes; to Farmingdale, only 26 minutes. Monthly commutation, however, is high, averaging between \$40.00 and \$45.00 or more than \$1.00 per ride.

Most of the South Jamaica study area is beyond one mile from the nearest limited access highway, the Van Wyck Expressway. However, once on it, expressway service is available east to Long Island, north to the Bronx, Westchester County, New Jersey or Connecticut and south via the Shore Parkway and the Southern State Parkway to southern Brooklyn, southern Queens and southern Nassau County. Other limited access highways, the Grand Central Parkway to the north and the Southern State Parkway to the south, are about 2 miles from the center of the study area. Of course, access to the expressway network does not insure congestion-free movement.

In sum, the South Jamaica study area's population can use two rapid transit lines, but both, for the most part, require a second fare or an excessively long walk to reach. The bus network provides good feeder service to these lines, but poor service to many other destinations. The Long Island Railroad offers frequent schedules but high fares for commuting eastward to Nassau and Suffolk counties. Access to the limited access highway network system is fair and the facilities are often congested.

Bushwick is defined by this study as health zone 34 in Brooklyn. Its boundaries are irregular but

never extend beyond Harmon Street, Irving Avenue, Weirfield Street and Broadway. The area is zoned almost exclusively for medium-density residential with the exception of a small commercially zoned area near Broadway. For a detailed description of the area's history, population and housing characteristics, reference should be made to Plan for New York City, 1969, A Proposal, Volume 3: Brooklyn, New York City Planning Commission.

Bushwick's rapid transit system consists of three lines that skirt the edge of the study area on all sides but never go through it. The LL service runs under Wyckoff Avenue about 700 feet north of the study area, and into Manhattan along 14th Street. The QJ and KK services run on elevated tracks over Broadway along the southwest edge of the study area. As described in the earlier section on South Jamaica, these provide service to lower Manhattan, Downtown Brooklyn and Midtown Manhattan. The M service, operating from 6 A.M. to 7 P.M. runs along Myrtle Avenue, joining the KK at Broadway and provides service to Lower Manhattan, substituting for the QJ during the morning rush period when the QJ skips the local stops between East New York and Essex Street. At other times, a shuttle to Myrtle and Broadway operates along Myrtle Avenue. Additional service is provided to Bushwick residents by back-tracking eastward on the LL, KK or QJ services to the Eastern Parkway-Broadway junction with the Independent line, where the A and E trains are available, providing service to southeast Queens, Downtown Brooklyn and the Manhattan Central Business District. Scheduled peak period running time on the LL, from Halsey Street and Wyckoff Avenue to Sixth Avenue and 14th Street, is 21.5 minutes. In the peak period, running times from Halsey Street and Broadway are scheduled at 25 minutes to Sixth Avenue and 42nd Street via the KK service. From Knickerbocker and Greene Avenues the M line is scheduled for 20 minute service to Broad Street during peak periods. Headways during these periods average about 3.5 minutes on the LL and 6 minutes on the KK or the M.

The bus service in Bushwick is substantial, particularly to Downtown Brooklyn. Three bus routes serve this traffic. Putnam Avenue # 26, Gates Avenue # 52, and DeKalb Avenue # 38 each run from Bushwick to Downtown Brooklyn and each run along Fulton Street in Downtown, for part of its length. In Bushwick, they are separated by 10 blocks from one another, which provides service for Bushwick residents to Downtown Brooklyn that never is beyond a

five block walk. However, one bus service is nonexistent to such nearby industrial areas as Long Island City, Woodside, Maspeth, Greenpoint and the Brooklyn Navy Yard. All fares are now 35 cents. Free transfers are available only on a haphazard basis.

Three stations of the Long Island Railroad are located in Brooklyn, the Brooklyn terminus at Atlantic and Flatbush Avenues and two others on Atlantic Avenue, at Nostrand Avenue and at East New York Avenue. Each of these stations is well beyond reasonable walking distance from Bushwick, requiring either a bus or subway to reach. The service provided to Nassau and Suffolk counties from these stations is almost as frequent as the service provided from Jamaica. However, running times from East New York average about eight minutes more and from Flatbush Avenue about 19 minutes more than those from Jamaica. Monthly commutation to Nassau County locations are generally in excess of \$40.00, or \$1.00 per ride.

Highway access for Bushwick residents is generally poor. The Interboro Parkway, with torturous curves and a low capacity provides an outlet to the east via the Grand Central Parkway and to the north via the Van Wyck Expressway. The Brooklyn-Queens expressway, heavily overloaded, runs about 2.5 miles to the west of the study area, providing indirect access to New Jersey and points north. North-south expressway service through the area is nonexistent, and local connections are very inconvenient.

In sum, Bushwick's subway service to Manhattan provides numerous choices, and bus service is good to Downtown Brooklyn but lacking elsewhere. Rail service to the east is hampered because the railroad stations are beyond reasonable walking distance and far too costly. The limited access highway network provides very poor service.

East Tremont is defined by this study as health zones 19 and 20.0 in the Bronx, bounded on the north by East 182nd Street and Bronx Park South, on the east by Vyse Avenue and Southern Boulevard, on the south by Crotona Park North, and on the west by Arthur Avenue. The entire area is zoned for medium- and high-density residential use. For a detailed description of the area's history, population and housing characteristics, reference should be made to Plan for New York City, 1969, A Proposal, Volume 2: The Bronx, New York City Planning Commission.

East Tremont's rapid transit service consists of two lines, both elevated. Trains on the White Plains Road line east of the study area stop at the intersec-

tion of East Tremont Avenue and Boston Road, about 1000 feet east of the edge of the area, and at the intersection of 174th Street and Southern Boulevard just beyond the southeast corner of the study area. Service is provided on this line at all times by the Seventh Avenue-White Plains Road Express to the west side of Manhattan, which eventually terminates at New Lots Avenue in Brooklyn. Direct service to the east side of Manhattan and to Utica Avenue in Brooklyn is provided from approximately 5 A.M. to 9 P.M. by the Lexington Avenue express. At other times the east side is reached by transferring to the Woodlawn Lexington Avenue express at 149th Street and the Grand Concourse.

The Third Avenue elevated line, some 600 feet to the west border of the study area, has stops at East 180th Street, East Tremont Avenue, and East 174th Street and serves as a shuttle service to 149th Street and Third Avenue for transferring to the White Plains line.

Scheduled peak period running times from East Tremont Avenue on the White Plains Road line are 31.5 minutes to 42nd Street and Seventh Avenue and 30.5 minutes to 42nd Street and Lexington Avenue. Headways average about five minutes during the peak period to the west side and about four minutes to the east side. The Third Avenue line runs on five minute headways during peak periods and its scheduled running time to 149th Street from East Tremont is 9.5 minutes.

The southeastern portion of the study area is reasonably close to this rapid transit system but the central portion, in the vicinity of Prospect Avenue, is beyond 2000 feet from the White Plains line. The western portion is generally close to the Third Avenue line but the "E1" requires a transfer for anyone travelling beyond 149th Street.

North-south bus service through or just beyond the East Tremont study area includes routes along Crotona Avenue, Southern Boulevard and Boston Road. The last serves the "Hub" retail district at 149th Street. The other two serve the industrial concentrations in the South Bronx in the vicinity of 138th Street and Bruckner Boulevard. The Bx 20 route on Southern Boulevard turns on Fordham Road, serving that important retail district. East-west service consists of two routes on Tremont Avenue and one on East 180th Street. Generally, they serve as feeders to the north-

south subway system. Frequency of service is good on most routes. Fares are all now 35 cents and no free transfers are offered.

The study area is served by the Penn Central Railroad, about 2000 feet west of the study area, with a stop at Park and East Tremont Avenue. Twenty northbound and fifteen southbound trains stop there each weekday, of which five northbound and three southbound trains stop during times suitable for reverse commuting. These peak period trains serve all stations to the north as far as Mt. Vernon with direct connections and north as far as White Plains either directly or with a transfer at Mt. Vernon. Running times range from 13 to 18 minutes to Mt. Vernon, and 32 to 36 minutes to White Plains. Monthly commutation to Mt. Vernon is \$17.00 and to White Plains \$26.00 or about 42 cents and 65 cents per ride, respectively. No trains of the New Haven service stop in the area, and points in southeastern Westchester County or Connecticut can only be reached via 125th Street in Manhattan.

East Tremont has excellent access to the limited access highway system; the Cross-Bronx Expressway goes directly through it. Entrance and exit ramps are less than one-half mile from the study area. The expressway provides access to Brooklyn, Queens, Nassau and Suffolk via the Bronx-Whitestone and Throgs Neck bridges, access to New Jersey via the George Washington Bridge, access to Westchester County, upstate New York and Connecticut via the Major Deegan Expressway, Bronx River Parkway, Hutchinson River Parkway and New England Thruway, and access to Manhattan via the Sheridan Expressway, Bruckner Expressway, Major Deegan Expressway and Henry Hudson Parkway. As in South Jamaica, access to the expressway system does not insure that the facilities will be free of traffic congestion; the Cross-Bronx Expressway is particularly overloaded.

In sum, the transportation service provided to East Tremont is spotty. True rapid transit is within reasonable walking distance for only about one-quarter of the study area's population, the "E1" or a bus being necessary for access to the system for the remaining population. The bus service generally is adequate and serves employment concentrations within the Bronx reasonably well. Rail service to Westchester is fast and not prohibitively expensive but the station is beyond reasonable walking distance for most of the study area. The limited access highways, though congested, provide good highway access to the Region.

The home interview: working age population characteristics.

Home interview surveys were conducted in the three study areas from August to October, 1970 by interviewers indigenous to each area under the supervision of Social Dimensional Associates, Inc. Interviewing was conducted from about 3 P.M. to 9:30 P.M. on weekday afternoons and evenings. In South Jamaica, one of every twelve households was pre-selected. If no one was home or if those at home were unresponsive, the next immediate household was selected. The more uniformly higher densities within Bushwick and within East Tremont suggested a different sampling technique. In these study areas every second block was preselected and as many interviews as possible were obtained in each. The average time required per interview was about fifteen minutes.

Table 74 summarizes the home interview control totals. In each case, the average number of persons per household was determined from the interviews and divided into 1970 population to determine the number of households in the area, which, in turn, permitted the calculation of the percent interviewed and the sampling factor.

Table 74.
Home Interview Control Totals for Three Study Areas.

	South Jamaica	Bushwick	East Tremont	Total
1970 Population	30,540	33,300	55,330	119,170
Persons per household	5.12	4.25	3.43	3.98
Households	5,965	7,850	16,110	29,925
Households Interviewed	443	955	1,066	2,464
Percent Sampled	7.41	12.17	6.51	8.23
Sampling Factor	13.50	8.22	15.13	12.14

Source: Regional Plan Association and U.S. Census

The questionnaire, reproduced at the end of the Chapter, was designed to obtain a considerable amount of detailed information without severely taxing the patience of the respondent. At a time when residents of poor areas are continually bombarded with surveys of all kinds, it was felt that the opening question was critical as an icebreaker. Thus, the first question was open-ended asking, "In your opinion, what are the major transportation problems in this neighborhood, including trips to work?" A checklist followed, allowing the respondent to itemize his particular complaints. The replies provided considerable information on the residents' attitudes toward the transportation system. Hopefully, it also made the respondent more willing to answer more specific and personal questions.

From the interviews, a profile of the working age population has been established. Table 75 shows this population as a percent of the total population; the number and percent in the labor force, both employed and unemployed; the unemployment rate and a breakdown of non-participation in the labor force by those in school, caring for family, and "others" who are not working because of health or retirement and those that give no reason for not working. Table 75 shows that the labor force participation rate in the three study areas is about 50 percent, a little higher in Bushwick, slightly lower in East Tremont. These variations between study areas remain consistent for both males and females with participation rates ranging from 74.0 to 80.4 percent and from 23.8 to 34.9 percent for men and women, respectively. However, unemployment rates in East Tremont are dramatically higher than the other two areas; almost double for men and almost triple for women.

About three-quarters of all those not in the labor force are either in school or caring for their families. The remaining 25 percent consists largely of those who gave no reason for not working, the "dropouts". This group includes about half of all men not in the labor force in Bushwick and East Tremont. About two-thirds of the women not in the labor force are caring for their families.

It is instructive to note that East Tremont, with the worst employment characteristics among the three areas, does not have the worst access to public transportation of the three areas: that dubious distinction belongs to South Jamaica.

Table 76 compares the labor force characteristics of our three study areas with New York City's minority population with respect to age distribution, labor force participation rates and unemployment rates.

The indication is that the study areas are characterized by abnormally low rates of participation in the labor force and disproportionately high rates of unemployment, when contrasted with the profile of minorities for the City as a whole. In part, this weak performance is explained by a more youthful structure of the population since the younger age groups tend to participate less in the labor market. Also, the under-representation of men in the working age population tends to depress the participation rate.

For each person 16 or older in the three study areas who was not working, an attempt was made to determine why. Table 77 indicates the percent distribution of the responses to this question by study area and by sex. Those who replied that they were

not working because of bad health or retirement were categorized as unemployable. If the reason given was poor pay, layed off, or poor education, the respondent was classified as employable and included in the labor

Table 75.
Employment Characteristics for Three Study Areas.

Employment Status	So. Jamaica	Bushwick	E. Tremont
Both Sexes			
Household population, 16 years and over ^a	1047	1396	1840
Percent of population	46.2%	34.4%	50.3%
Labor Force	521	731	876
Labor Force participation rate	49.8%	52.4%	47.6%
Employed	479	666	733
Unemployed	42	65	143
Unemployment rate	8.1%	8.9%	16.3%
Not In Labor Force	526	665	964
In school	26.8%	17.1%	20.2%
Caring for family	51.0%	58.2%	55.8%
Other	22.2%	24.7%	24.0%
Males			
Household population, 16 years and over	479	536	867
Percent of male population	43.3%	28.7%	49.0%
Labor Force	364	431	644
Labor Force participation rate	76.0%	80.4%	74.0%
Employed	340	401	572
Unemployed	24	30	72
Unemployment rate	6.6%	7.0%	11.2%
Not In Labor Force	115	105	229
In school	73.8%	46.6%	51.5%
Other, including caring for family	26.2%	53.4%	48.5%
Females			
Household population, 16 years and over	568	860	973
Percent of female population	48.7%	38.6%	51.7%
Labor Force	157	300	232
Labor Force participation rate	27.6%	34.9%	23.8%
Employed	139	265	161
Unemployed	18	35	71
Unemployment rate	11.5%	11.7%	30.6%
Not in Labor Force	411	560	735
In school	15.6%	11.6%	10.3%
Caring for family	64.7%	68.8%	71.2%
Other	19.7%	19.6%	18.5%

^a All numbers in table refer to sample.

Source: Regional Plan Association.

Table 77.
Reasons for Not Working in Three Study Areas.
Persons 16 Years and Older.

	Both Sexes			Male			Female		
	S. Jamaica	Bushwick	E. Tremont	S. Jamaica	Bushwick	E. Tremont	S. Jamaica	Bushwick	E. Tremont
In Labor Force ^a	7%	9%	13%	17%	22%	24%	4%	6%	9%
In School	25	16	18	55	36	40	15	11	9
Caring for family	47	54	49	1	1	4	62	66	65
Unemployable ^b	10	17	6	12	33	13	10	13	3
No reason given	10	4	15	14	7	19	9	3	14
Number not working (sample)	568	780	1,107	139	135	295	429	595	812

^a i.e. unemployed but looking for a job.

^b retired, poor health, etc.

Source: Regional Plan Association.

force. It is interesting to note that of the 2,405 persons surveyed who were not working only one gave as a reason "poor transportation." From 17 to 24 percent of non-working men, and from 4 to 9 percent of non-working women, are employable.

To examine the employable group that was assigned to the unemployed labor force, the appropriate expansion factor for each of the study areas was applied to produce a breakdown by age, sex and education for the three areas combined. Table 78 shows this.

It is instructive to compare the age distribution and the educational attainment distribution of this unemployed labor force with those of the employed labor force as shown in Table 79 and 80.

Table 76.
Three Study Areas and New York City Minorities; Labor Force Comparisons.

Labor Force Characteristics	Three Study Areas	New York City (minorities only)
Working Age Population		
Distribution	100.0%	100.0%
16-25 years	26.6	25.1
25-40 years	51.1	33.3
40-65 years	18.1	34.1
65 & over	4.3	7.5
Labor Force Participation Rates	49.2%	62.4%
16-25 years	29.8	57.3
25-40 years	59.6	70.0
40-65 years	56.0	69.1
65 & over	12.9	15.6
Male	76.6	81.5
Female	20.7	46.5
Unemployment Rates	12.5%	5.4%
16-25 years	15.1	
25-40 years	12.5	
40-65 years	7.2	n.a.
65 & over	59.5	
Male	9.1	
Female	19.8	n.a.

Note: The New York City unemployment rate for minorities, as reported by the Bureau of Labor Statistics (BLS), reflects only non-white joblessness. It does not include the considerably higher share of unemployed Puerto Ricans, whose labor force characteristics are ordinarily incorporated in data for the white population as a whole. The only current indicator of exclusively Puerto Rican joblessness is given for the South Bronx poverty area (9.6% in 1969) from a survey conducted by the BLS.

Source: Regional Plan Association.

It is clear that males under 25 years of age are disproportionately represented in the unemployed labor force. Only 14.3 percent of all working men are under 25 but 21.9 percent of the unemployed labor

force are in that age group. The characteristics of the employed and unemployed women show little difference by age.

The differences in the distributions of educational attainment between the employed and unemployed labor force is considerably more striking. Over two-thirds of the workers in the three study areas have a high school diploma but only one-third of the unemployed have completed high school. These huge differences hold true for both men and women.

Table 81 views the problem in another manner, showing the unemployment rate by educational attainment and by sex.

Table 81.
Unemployment Characteristics by Educational Attainment and Sex in Three Study Areas.

	Not H.S. Grad.	H.S. Grad.	College Grad.	Total
Total Labor Force	8,830	14,200	1,920	25,950
Unemployment Rate	21.3%	0.0%	7.1%	10.9%
Male Labor Force	5,450	11,300	1,260	18,010
Unemployment Rate	15.7%	4.9%	5.3%	8.2%
Female Labor Force	3,380	3,900	600	7,940
Unemployment Rate	30.2%	9.3%	11.1%	18.5%

Note: Unemployment rates may not coincide with earlier tables because this table excludes those that did not reply to education question.
Source: Regional Plan Association.

High unemployment rates are clearly associated with the female labor force and a lack of a high school education. Surprisingly, college graduates have slightly higher unemployment than high school graduates, although that may be the result of a small sample size.

Examining only the characteristics of the unemployed does not give the entire picture. The incidence of low earning among the employed deserves closer scrutiny. Using the earnings data provided by the interviews, Table 82 was produced showing the percent distribution and mean weekly earnings for the three study areas.

South Jamaica workers earn slightly more than East Tremont workers who, in turn, earn slightly more than Bushwick workers. More striking however, is the earnings gap between male and female workers, consistent in each area.

From Table 82, the percent of workers earning under \$100 per week can be determined (as shown in Table 83).

Table 78.
Unemployed Labor Force in Three Study Areas, by Age, Sex, Education.

Age	Education	Both Sexes	Male	Female
16-25	Not H.S. Grad.	373	154	219
	H.S. Grad.	232	154	78
	College Grad. ^a	15	15	0
	Total 16-25	620	323	297
	Percent 16-25	21.2	21.9	20.4
25-40	Not H.S. Grad.	1,171	496	675
	H.S. Grad.	470	317	153
	College Grad. ^a	123	48	75
	Total 25-40	1,764	861	903
	Percent 25-40	60.2	58.5	61.9
40+	Not H.S. Grad.	337	209	128
	H.S. Grad.	209	79	130
	College Grad.	0	0	0
	Total 40+	546	288	258
	Percent 40+	18.7	19.5	17.7
Total Persons (expanded)		2,930	1,472	1,458
Percent		100.0	100.0	100.0

^a Includes small number of vocational training graduates

Source: Regional Plan Association.

Table 79.
Age Comparison of Unemployed and Employed Labor Force in Three Study Areas.

Age Group	Both Sexes		Male		Female	
	Un-employed	Employed	Un-employed	Employed	Un-employed	Employed
16-25	21.2%	15.7%	21.9%	14.3%	20.4%	21.5%
25-40	60.2	61.9	58.5	62.7	61.9	58.7
40+	18.7	22.4	19.5	23.1	17.7	19.8
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total persons (expanded)	2,930	23,020	1,472	16,540	1,458	6,480

Source: Regional Plan Association.

Table 80.
Educational Attainment Comparison of Unemployed and Employed Labor Force in Three Study Areas.

Education	Both Sexes		Male		Female	
	Un-employed	Employed	Un-employed	Employed	Un-employed	Employed
Not H.S. Grad.	64.2%	30.1%	58.3%	27.7%	70.2%	36.3%
H.S. Grad.	31.1	61.9	37.3	65.0	24.8	54.5
College Grad.	4.7	7.8	5.4	7.3	5.1	9.2
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total persons (expanded)	2,930	23,020	1,472	16,540	1,458	6,480

Source: Regional Plan Association.

Table 82.
Distribution of Weekly Earnings in Three Study Areas.

Weekly Earnings	South Jamaica			Bushwick			East Tremont		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
\$0-50	1.0%	0.9%	1.1%	0.9%	0.4%	1.7%	0.8%	0.8%	0.8%
\$50-70	3.0	2.4	4.4	4.5	2.2	8.1	2.4	1.6	5.8
\$70-100	13.6	9.5	23.4	27.5	20.4	38.5	22.9	18.2	42.1
\$100-150	47.2	46.0	50.0	44.7	48.2	39.1	45.4	47.8	35.5
\$150-200	27.2	33.2	13.3	18.1	22.6	10.8	21.4	23.7	12.4
Over \$200	8.0	8.1	7.8	4.5	6.2	1.7	7.0	7.9	3.3
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Mean earnings	\$138	\$143	\$126	\$124	\$133	\$110	\$131	\$135	\$113
Number of persons (unexpanded)	301	211	90	448	274	174	616	495	121

Source: Regional Plan Association

Table 83.
Percent of Workers Earnings Less than \$100 per Week in Three Study Areas.

	Both Sexes	Male	Female
South Jamaica	17.6%	12.8%	28.9%
Bushwick	32.9	23.0	48.3
East Tremont	26.1	20.6	48.7
Total Study Area	25.3	18.9	42.7

Source: Regional Plan Association.

Table 84.
Average Earnings by Age, Education and Driver's License in Three Study Areas.

Age	S. Jamaica	Bushwick	E. Tremont
16-25	\$124	\$114	\$125
25-40	135	128	131
40-65	145	139	135
Education			
Not H.S. Grad.	\$133	\$116	\$114
H.S. Grad.	139	125	132
College Grad.	172	170	160
Vocational Grad.	—	157	164
Driver's License			
Yes	\$145	\$139	\$141
No	117	108	114

Source: Regional Plan Association.

If it is somewhat arbitrarily assumed that under \$100* is less than a living wage, then from one-sixth to almost one-third of workers in the three areas fit this definition of underemployment. Female workers, again, show up poorly: almost half in Bushwick and East Tremont earning under \$100, more than double the rate of male workers in each of the three study areas.

Age, education and possession of a driver's license of the workers were tabulated by earnings to

*Equivalent to NYC HRA maximum annual income for a family of 4.

Table 85.
Target Population of Three Study Areas.

	S. Jamaica	Bushwick	E. Tremont	Total
Both Sexes, Working Age	14,120	11,500	27,860	53,480
Labor Force	7,050	6,020	13,250	26,320
Employed	6,470	5,480	11,090	23,040
a) Under \$100/week	1,140	1,810	2,880	5,830
b) Unemployed	570	530	2,160	3,260
Not in Labor Force	7,080	5,480	14,610	27,170
Caring for family	3,620	3,200	8,160	14,980
c) Caring for family, 40-65	830	480	520	1,830
d) No reason (half)	380	140	1,250	1,770
Assumed Target Population a + b + c + d	2,920	2,960	6,810	12,690
Total Population	30,541	33,303	55,324	119,168
Percent Target of Population	9.6	8.9	12.3	10.6
Percent Target of Working Age	20.7	25.8	24.4	23.7
Males, Working Age	6,310	4,420	13,120	23,850
Labor Force	4,920	3,540	9,740	18,200
Employed	4,590	3,300	8,660	16,550
a) Under \$100/week	580	750	1,780	3,110
b) Unemployed	330	230	1,080	1,640
Not in Labor Force	1,390	880	3,380	5,650
Caring for family	30	250	10	290
c) Caring for family, 40-65	10	60	0	70
d) No reason (half)	110	40	420	570
Assumed Target Population (a-d)	1,030	1,080	3,280	5,390
Total Population*	14,520	15,320	26,850	56,700
Percent Target of Population	7.1	7.1	12.2	9.5
Percent Target of Working Age	16.3	24.5	25.0	22.6
Females, Working Age	7,810	7,080	14,740	29,630
Labor Force	2,130	2,480	3,510	8,120
Employed	1,880	2,180	2,430	6,490
a) Under \$100/week	560	1,060	1,100	2,720
b) Unemployed	240	300	1,080	1,620
Not in Labor Force	5,690	4,600	11,230	21,520
Caring for family	3,590	2,950	8,150	14,690
c) Caring for family, 40-65	820	420	520	1,760
d) No reason (half)	270	100	830	1,200
Assumed Target Population (a-d)	1,890	1,880	3,530	7,300
Total Population*	16,020	17,980	28,470	62,470
Percent Target of Population	11.8	10.5	12.4	11.7
Percent Target of Working Age	24.2	26.6	23.9	24.6

* Assumes population under 16 years of age is allotted equally to both sexes.
Source: Regional Plan Association.

better understand the characteristics of the employed labor force. Table 84 shows these.

It is clear that in all three study areas, age, education and possession of a driver's license all have a significant positive impact on earnings. Most striking is the effect of possession of a driver's license, resulting in an increase of about \$30 in the average weekly earnings in each study area. In fact, possession of a driver's license has almost as much impact as possession of a college diploma!

The foregoing data suggest that a discussion of a potential target population for improvement of economic status must necessarily focus on four categories of the population. They are: a) employed persons earning under \$100 per week--the underemployed; b) the unemployed members of the labor force, the "employable unemployed"; c) potential workers presently caring for their families; and d) those not in the labor force who are neither in school nor caring for their families. Accordingly, Table 85 was prepared combining much of the previous data to dimension a target labor pool for the three study areas.

Somewhat arbitrary definitions of this target population have been used. Those earning under \$100 per week are arbitrarily defined as "underemployed." Those caring for family, but old enough that their children are likely to be at least in grade school, are arbitrarily defined as "prospective job holders," and half the persons who did not give a reason for not working are arbitrarily included as employable.

Emerging from Table 85 is a rather uniform statistical picture across the three study area. Between twenty and twenty-five percent of all persons over 16 can be considered as a target for job upgrading or inclusion into the working population. Among working age men, 22.6 percent constitute the target population and among women 24.6 percent. These percentages represent 9.5 and 11.7 percent of the total population, respectively. Of the entire three-area target population, the largest component is the underemployed; about 46 percent fit this category. Twenty-six percent of the target population are unemployed members of the labor force. The remainder are evenly divided between potential day care parents and those not in the labor force. The target population of women includes about twenty-five percent who are potential users of day care centers.

Home interview survey: work location and travel mode.

As part of the survey, respondents were asked to describe the trips to work made by members of the household. For public transit trips, details of their trip, including distances walked, stations and stops used, transfer points, routes and lines used, fares, total travel time, and location of job were obtained. It should be kept in mind that in some cases the information was being supplied by persons other than the ones actually making the trip.

The geographic distribution of the job location of employed persons in each study area was determined. Table 86 shows that distribution, dividing job locations into four categories: Manhattan south of 60th Street; same borough as study area; other New York City locations; and outside of New York City.

Table 86.
Work Trip Destinations in Three Study Areas.

	S. Jamaica % of Total	Bushwick % of Total	E. Tremont % of Total	3 Areas % of Total
Manhattan CBD	27.6	31.6	24.8	27.2
Same borough	41.4	55.8	52.9	50.5
Other NYC	23.9	10.3	16.3	16.9
Total NYC	92.9	97.6	94.0	94.7
Outside NYC	7.1	2.4	6.0	5.3
Total	100.0	100.0	100.0	100.0
Number of Persons (expanded)	5,700	5,310	10,070	21,080

Source: Regional Plan Association.

Probably the most striking feature of Table 86 is the low percentage of workers having jobs in the Central Business District (CBD)--only 27.2 percent. This is in sharp contrast to all workers residing in the City outside Manhattan, 39 percent of whom work in the CBD.

Also notable is the proportion of work trip destinations beyond the City's borders: only 5.3 percent work outside the City, a proportion only slightly higher than City-wide averages. The farther each of the three areas are from the City's border, the smaller the proportion of trips made beyond that border.

In South Jamaica, 7.1 percent of the employed labor force work outside the City, mostly in Nassau and Suffolk counties. In Bushwick and East Tremont, employed residents are less likely to work beyond the City limits; 2.4 percent of Bushwick residents do so.

The foregoing suggests that study area residents do not work in numbers proportionate to the number of jobs in the CBD because of a lack of skills, thereby losing the advantages of the CBD's accessibility via

the subway system; and they do not work in particularly large numbers in the suburbs, where their limited skills could be used, because of lack of accessibility. The bulk of the employed labor force in the three study areas work either in their home boroughs or in adjoining ones, where jobs that tend to require limited skills exist and can be reached by either bus, subway or some combination of the two.

The distribution by mode of travel used by the study area residents to get to work is shown in Table 87. South Jamaica and East Tremont workers display very similar modal characteristics, featured by more than 40 percent who use the automobile to get to work. Only about one-sixth of the Bushwick workers, on the other hand, are so characterized, relying to a greater extent on bus and subway service. Walk-only trips account for 6 to 8 percent of all trips to work. Rail or taxi trips are negligible.

These results of the home interview survey carried out as part of this study are also compared in Table 87 with two other sources, the 1960 Census journey to work data, and the 1963 Tri-State Regional Planning Commission Home Interview Survey, which included all trips, not merely trips to work.

It is evident that in South Jamaica and Bushwick the 1970 and 1960 data are comparable. Walk trips and bus trips are roughly the same, while subway trips declined at the expense of more automobile trips. The magnitudes of the switch from subway to auto are plausible. In East Tremont, the survey results would suggest a more than doubling of auto trips to work, and a decline of subway riding to work of virtually one half. The latter is questionable since turnstile entries at the five subway stations serving the study area declined only 16 percent between 1960 and 1970, from 8.63 million in 1960 to 7.28 million in 1970.

In Bushwick, subway turnstile entries at six stations serving the area declined 6.5 percent between 1960 and 1970, from 7.42 million to 6.94 million. This is also less than the decline implied by Table 87, but more comparable to it. Part of the difference may be explained by the assumption that trips to work by subway from the areas in question declined more than subway trips for other purposes. Generally, while the 1960 Census figures, the 1970 figures from this study, and the turnstile counts cannot be reconciled in detail, on the trend of subway use, as expressed in differences between the three study areas, and in changes in these differences over time, there is agreement. The decline in subway use in Tremont was more pronounced than in Bushwick,

despite the higher density of the former, probably because nearby blue-collar job opportunities reachable by subway are sparse.

The Tri-State data are not strictly comparable, not only because walking trips are excluded, but also because auto, bus and taxi are used for non-work purposes to a much greater degree than the subway; they are listed simply as a point of reference.

Of course, the mode of travel to work is largely dictated by work location and any attempt at drawing conclusions based on Table 87 would be amiss without looking at work location and travel mode simultaneously in each area in more detail.

Table 88 shows this detail for South Jamaica work trips where both the mode and destination are known. Work trips made to locations nearby are predominantly on foot, with some representation of buses. To other locations within Queens the automobile is dominant, with 63 percent of the total, while buses get most of the remainder and subways receive only about 5 percent. For trips to Brooklyn, 63 percent of trips are likewise by automobile, but the bus and subway

Table 87.
Travel Mode in Three Study Areas.

	1970 trips to work (this study).		
	South Jamaica	Bushwick	East Tremont
Walk	5.6%	6.6%	7.8%
Bus	15.5	27.9	12.5
Subway	31.7	47.8	30.2
Rail	0.3	0.0	0.2
Auto driver	41.6	15.5	43.7
Auto passenger	5.3	2.3	5.4
Taxi	0.0	0.0	0.3
	100.0%	100.0%	100.0%
Number of workers	5,319	4,833	20,233
	1960 trips to work, U.S. Census ^a .		
Walk	5.0%	9.3%	8.7%
Bus	16.3	22.0	14.0
Subway	38.9	53.0	58.2
Rail	3.4	0.8	1.6
Auto	35.3	14.4	16.8
Other	1.1	0.5	0.7
	100.0%	100.0%	100.0%
Number of workers	94,406	127,862	102,231
	1963 trips for all purposes to residential buildings, TSRPC ^b .		
Bus	23.5	26.8	28.1
Subway	19.7	57.8	50.6
Rail	0.5	1.1	0.0
Auto driver	34.2	9.2	9.5
Auto passenger	20.2	2.7	10.7
Taxi	2.0	2.4	1.0
	100.0%	100.0%	100.0%
Number of trips	20,825	36,524	35,817

Notes: ^a Excludes "work at home" and refers to zones larger than the study areas

^b Excludes walking trips and refers to square miles roughly centered on study areas

Source: Regional Plan Association and as noted.

modes almost precisely reverse the shares they had to Queens, reflecting the greater density of Brooklyn subway lines and of Brooklyn work locations. To the Manhattan CBD the dominant mode is the subway but 27 percent travel by automobile. Previous study of mode choice in the New York Region as presented in Chapter 4, suggests that only about 10 percent of these work trips would be expected to be made by automobile. To other locations within the City the subway still predominates, but to locations beyond the City line the automobile captures 69 percent of the market with buses getting a sizeable share (mostly to inner Nassau County). Trips by railroad are negligible.

In sum, of the more than 5,300 trips represented in Table 88 almost 60 percent are destined for either Brooklyn or Queens and over 60 percent of these trips are made by automobile. To the Manhattan CBD most take the subway but sizeable numbers drive or are driven. Of all the work trips, 46.9 percent are made by automobile, as shown in Table 87. By contrast, in 1960 only 35 percent of the southeastern Queens residents travelled to work by automobile, according to the U.S. Census. Granted the obsolescence of the 1960 Census data, these findings suggest that an increasing number of South Jamaica residents are using automobiles to travel to work regardless of work location.

The situation in Bushwick is markedly different. Table 89 gives the breakdown of travel mode by work trip destination for those Brooklyn residents. The automobile is used quite sparingly, by 17.8 percent of the workers, an increase from 14.3 percent in 1960. The majority drives only for trips outside the City. Walk trips predominate for locations under one mile. To the remainder of Brooklyn, three-quarters of all work trips are made by public transportation, two-thirds of those using buses. Travel to the CBD is almost exclusively by subway. Only 7 percent use automobiles. To the remainder of the City, half use the subway. No one surveyed in Bushwick used the railroad to reach work. In sum, Bushwick workers' choice of mode is strongly influenced by the geographic position of the area and the availability of transit. For the most part, those going nearby walk, those going to other parts of Brooklyn use buses, those going to Manhattan ride the subway, and those leaving the City drive.

East Tremont, on the other hand, despite its high density of development, displays many of the mode choice characteristics of South Jamaica. Overall, an incredibly high 49 percent of the workers in-

terviewed reported driving to work, compared to only 16.5 percent reported by the 1960 Census. Table 90 shows the mode choice by destination. Just as in South Jamaica, over 60 percent of trips made within the home borough but beyond the immediate area, are made by automobile. In South Jamaica, 27 percent of trips to the Manhattan CBD are made by automobile and in East Tremont supposedly yet a larger proportion, 41.5 percent, drive or are driven.

Because of the surprisingly large number of East Tremont workers using automobiles to travel to the Manhattan CBD, the destinations of this group were

Table 88.
Work Trip Mode by Destination, South Jamaica.

Mode	Within One mile	Other Queens	Brooklyn	Manh. CBD	Other NYC	Outside NYC
Walk	75.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Bus	20.7	32.1	4.8	1.8	0.0	24.1
Subway	0.0	5.2	32.3	71.5	61.3	3.5
Rail	0.0	0.0	0.0	0.0	0.0	3.5
Auto driver	3.5	54.5	56.5	25.7	38.7	51.7
Auto passenger	0.0	0.2	0.5	0.9	0.0	17.2
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Trips	392	1810	837	1472	418	392

Source: Regional Plan Association.

Table 89.
Work Trip Mode by Destination, Bushwick.

Mode	Within One Mile	Other Brooklyn	Manh. CBO	Other NYC	Outside NYC
Walk	55.1%	0.0%	0.0%	0.0%	0.0%
Bus	35.2	50.8	0.5	13.4	0.0
Subway	2.7	26.9	92.8	51.7	20.0
Auto driver	5.6	19.6	6.8	28.3	70.0
Auto passenger	1.4	2.7	0.0	6.7	10.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Total Trips	583	2137	1586	494	82

Source: Regional Plan Association.

Table 90.
Work Trip Mode by Destination, East Tremont.

Mode	Within One Mile	Other Bronx	Manh. CBD	Other NYC	Outside NYC
Walk	60.5%	0.0%	0.0%	0.0%	0.0%
Bus	19.8	24.5	0.0	0.0	2.6
Subway	3.5	13.0	58.5	58.5	5.1
Rail	0.0	0.0	0.0	0.0	2.6
Auto driver	15.1	59.4	29.8	37.7	79.5
Auto passenger	1.2	3.1	11.7	2.8	10.3
Taxi	0.1	0.4	0.0	0.9	0.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Total Trips	1301	3949	2588	1604	590

Source: Regional Plan Association.

examined more closely. Almost 80 percent of them work west of Fifth Avenue. This suggests that these drivers may have minimized parking costs by parking on the fringe of the CBD west of Eighth Avenue, making it less costly to drive to Manhattan. Alternate side of the street parking regulations in East Tremont might also be an influence in the use of the automobile during the day to travel to work, whereas in the other two study areas the lower density might make it easier to find on-street parking.

Bus trips by East Tremont workers are made by one-quarter of the jobholders. Almost all of these trips are to other locations in the Bronx. The subway serves about 6 of every ten destined for either the CBD or the rest of the City. Only a handful use the railroad or taxis.

Having examined how choice of travel mode is influenced by work location, it is now possible to turn to the characteristics of the major modes of travel that have resulted in mode choice differences among the three areas. To do this, we will examine how the residents of the three areas use each of the travel modes with regard to the routes taken, the fares paid, and the length of trip both in time and distance.

The walk trip.

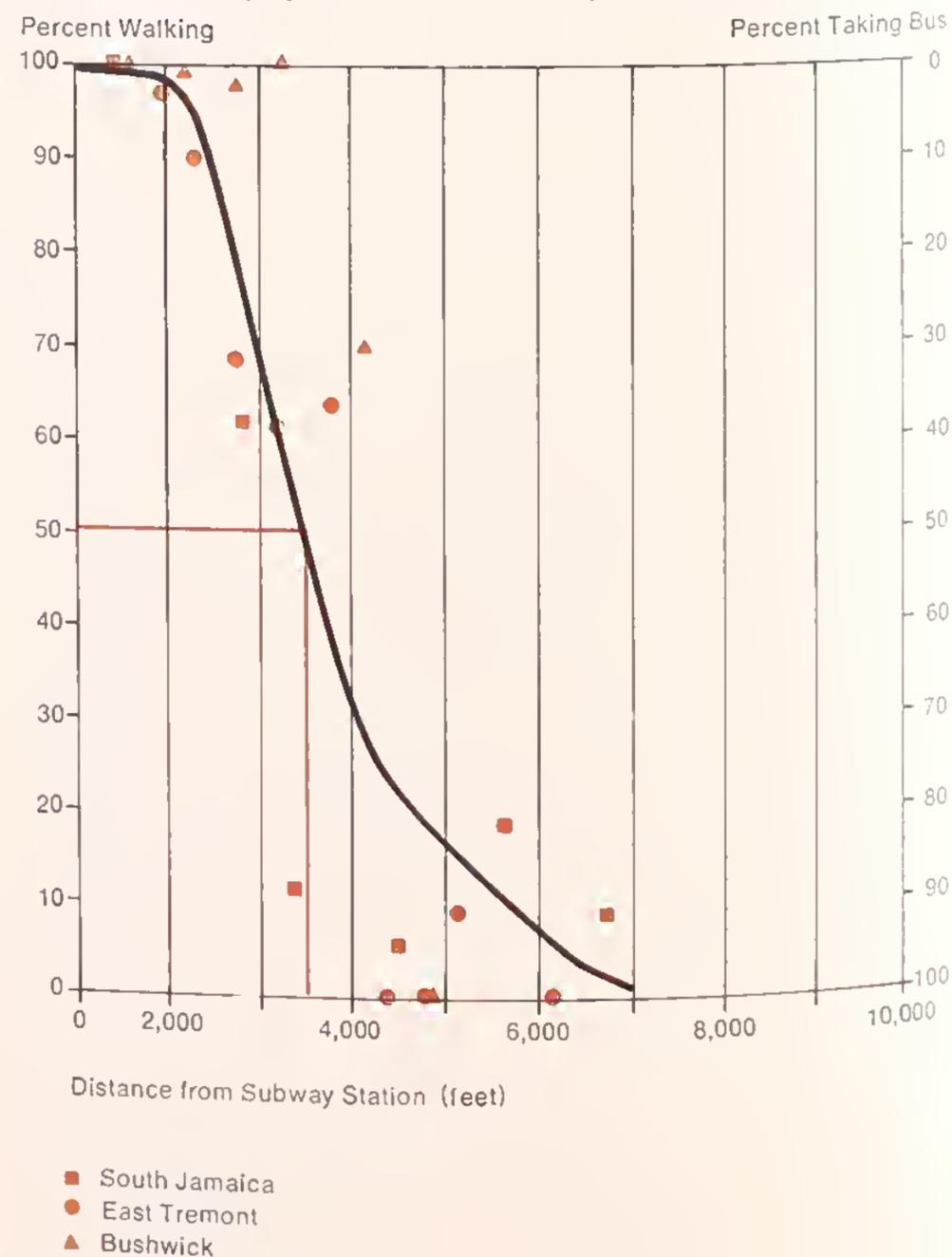
Study area residents who walk to work range from 5.6 percent in South Jamaica to 7.8 percent in East Tremont. While these variations are not great, it is of some interest to note that the percentage of workers who walk increases as the residential density of each area increases. It is logical that as the number of jobs within a mile increases (no one surveyed walked more than one mile), the number of walkers will increase. And the number of jobs in a residential neighborhood is likely to be in proportion to the residential density of that neighborhood. It is therefore possible to increase the jobs within walking distance by increasing residential density as well as the more obvious way, increasing employment density. This possibility is an emerging one as Jamaica Center develops. Making it possible to walk to work does provide a non-transportation solution to a transportation problem.

Of course, walking is a portion of the trip for those using the transit system and the length of the walk portion of the work trip is a critical factor related to the free transfer issue. How far will people walk before they are willing to pay an additional fare? It will be recalled that in the selection process of the study areas, 2000 feet was assumed as a rough mea-

sure of convenient accessibility to the mass transit system.

Using the home interview surveys of the three study areas, the variation in the percentage walking to the mass transit system as the distance to the station varies, was determined. Grouped by 500 foot intervals, the results are shown in Chart 30. It is clear that less than 2000 feet from a station most people walk and beyond 3000 feet most people take a bus. In the 2000-3000 foot range, considerable variation exists, probably the result of the characteristics of the particular bus routes involved and the distance to be walked to reach them. It is fair to conclude that those beyond 3000 feet would be direct beneficiaries of any free bus-to-subway transfer and that those within 2000-3000 feet would use a feeder bus system with greater frequency. Approximately 6000 feet can be considered the outside limit of walking to transit stations.

Chart 30
Percent Walking by Distance to Subway Stations



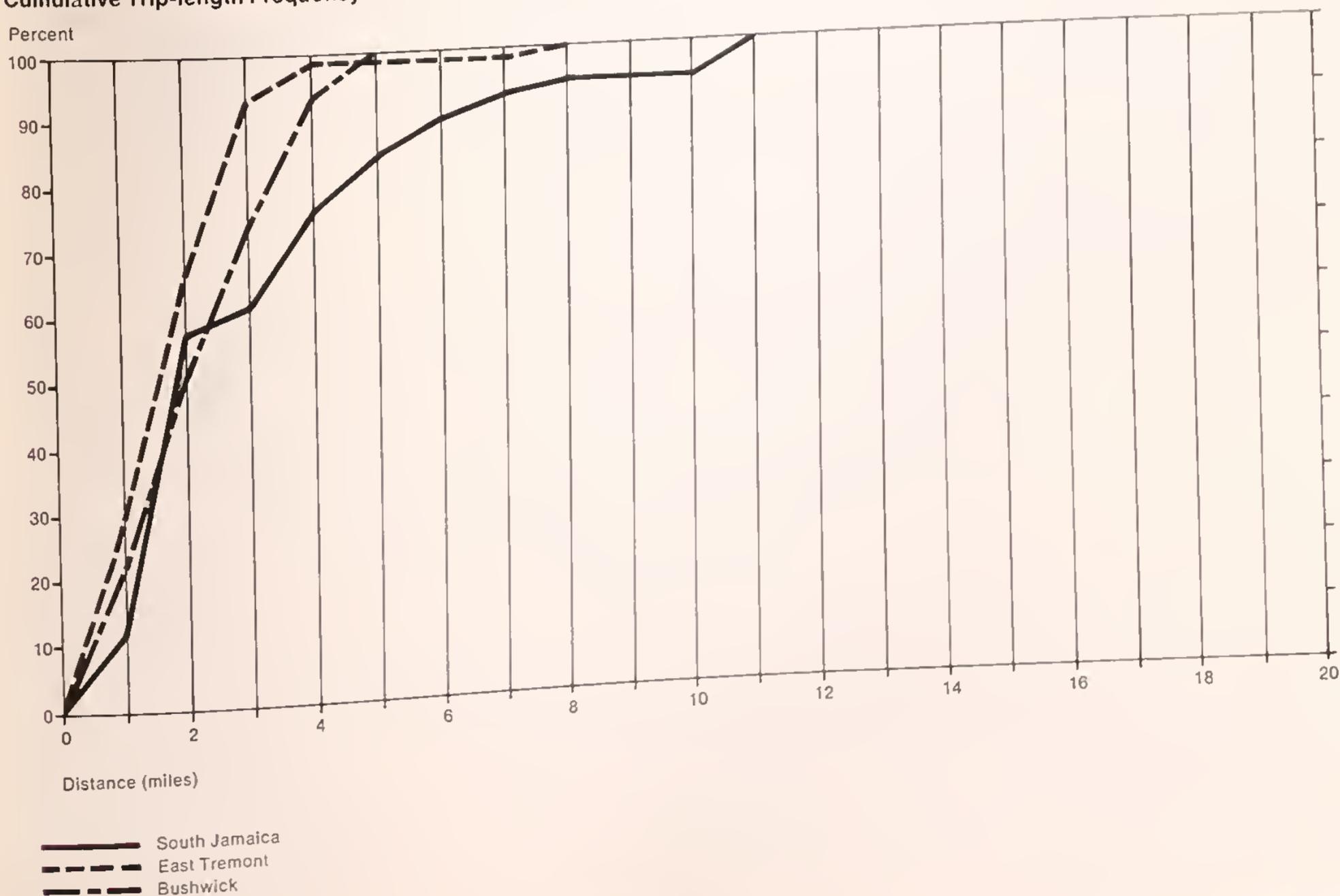
The local bus trip.

Fifty-eight percent of all work trips by bus in the three study areas are under two miles, 89 percent are under four miles. Also, 92 percent of all bus trips are destined within the borough of origin. Clearly, buses serve a short-haul intra-borough function. Chart 31 shows the cumulative trip length frequency distribution for each of the study areas. In all three, the median trip (50% accumulation) is under two miles and only in South Jamaica is there a substantial number of trips beyond four miles.

Map 25 shows the bus routes that touch the residential sections of the South Jamaica study area, thereby illustrating the extent of the one-bus rides for study area residents. Superimposed in color in proportion to actual usage is the flow of work trips made entirely by bus. Clearly shown are the work trips that require more than one bus and usually, more than one fare.

This is the flow that does not show a coincident bus route. The pattern of bus trips to work is characterized by the large number of persons riding buses north to Jamaica and Hillside Avenues along one of the three north-south boulevards--Sutphin, New York and Merrick--that run through the study area. Of the more than 800 trips that are made exclusively by bus, almost 80 percent use buses in that particular corridor. The remaining scatter along routes to the south and east. Of those travelling north, only 17 percent are destined for Jamaica Center, the others transferring to a variety of routes. And this is the problem. As Map 25 indicates, a number of routes to the north, east, and west of South Jamaica are patronized by study area residents but this is done at the expense of two buses and usually two fares. This problem is created by the multitude of bus operators in and around Jamaica, six in all, each having routes that terminate in the vicinity of Jamaica, each cover-

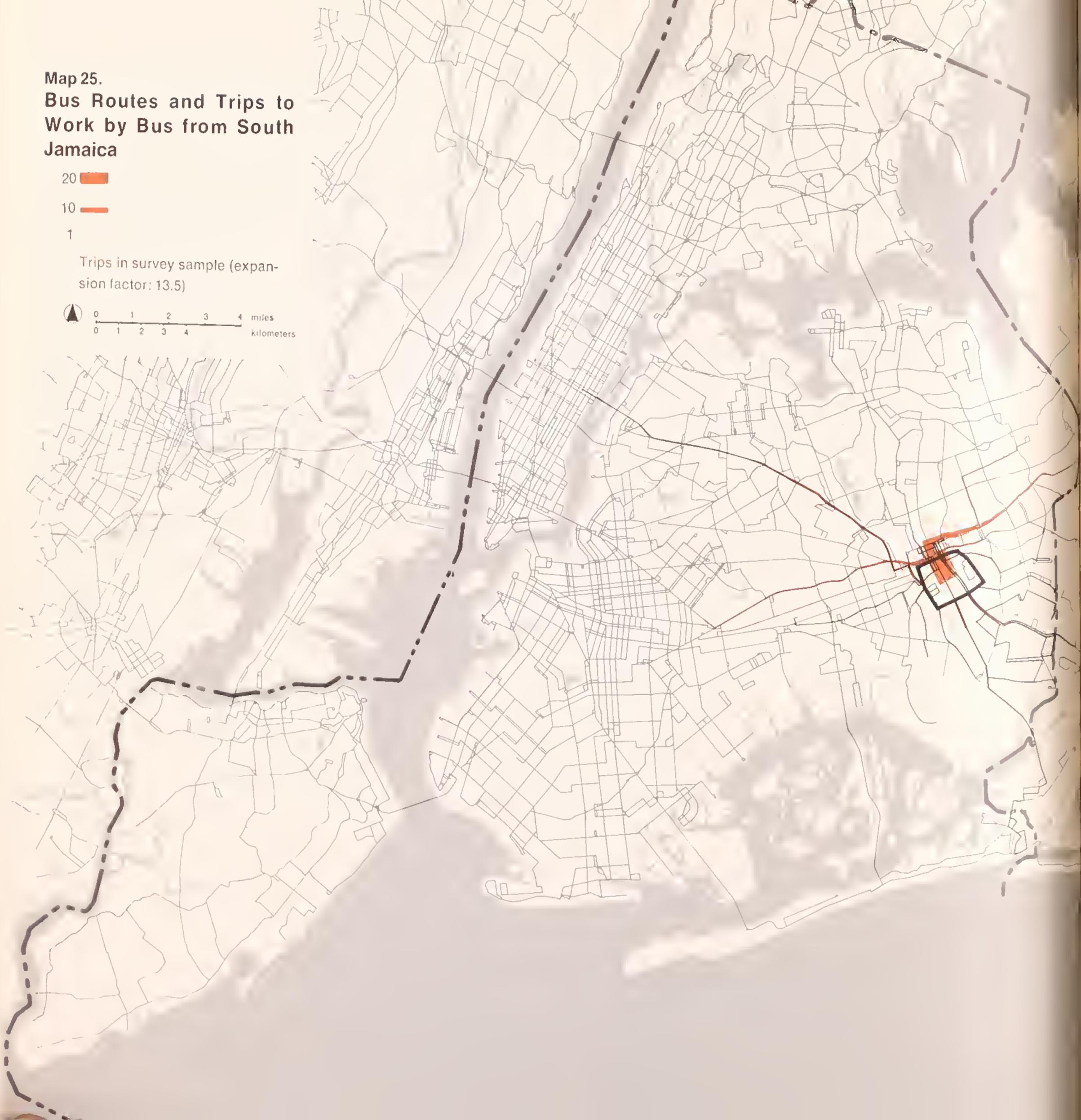
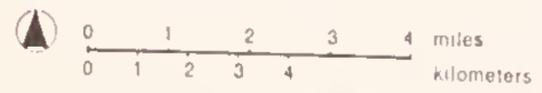
Chart 31
Cumulative Trip-length Frequency Distribution, Bus



Map 25.
Bus Routes and Trips to
Work by Bus from South
Jamaica



Trips in survey sample (expansion factor: 13.5)



ing a different sector radiating from Jamaica Center and each providing free transfers to their routes only. None have routes that go through the study area on to Jamaica or Hillside avenues and then to points to the north, east or west. This system automatically creates two-fare trips for South Jamaica residents. For example, residents of South Jamaica working along Hillside Avenue east of Jamaica, of which there are approximately 200, can choose from among five New York City Transit Authority routes running on Merriek Boulevard, that will take them north where they can transfer to a series of Hillside Avenue routes also run by the Transit Authority. To avoid the two bus situation it would only be necessary to combine one Merriek Boulevard route with one Hillside Avenue route. For those South Jamaica residents living on the western side of the study area well beyond walking distance of Merriek Boulevard, combining routes of the same bus operator would not do, since only bus companies that do not serve Hillside Avenue are serving Sutphin and New York boulevards. In this case, combining routes of two separate operators or a merger of operators would be necessary. Similar difficulties prevent those working in western Queens or Brooklyn from avoiding two fares westward along Jamaica Avenue. While combining routes will eliminate many double fares and two-bus trips, the double fare for South Jamaica residents could be virtually eliminated by creating free transfers for all routes crossing in Jamaica Center.

Presently four local bus routes serve John F. Kennedy International Airport. None touch the residential portions of South Jamaica, although route # 9 of the Green Bus Lines does originate on Jamaica Avenue. A number of simple adjustments of routes is possible to provide access by public transportation that is now virtually nonexistent to this important employment concentration. For example, Green Bus Lines route # 40, which runs along Sutphin Boulevard and along 142nd Street, might be adjusted to serve directly into the Central Terminal area at Kennedy. Other possibilities include the extension of Transit Authority route # 3 and Jamaica Buses route # 111/113 into the hangar area.

The emergence of College Point in northern Queens as a prime industrial area with a potential for 12,000-15,000 jobs could create a market for a bus service from South Jamaica, despite the relatively long distance of seven miles.

Bus service running through the Bushwick study area is rather plentiful. Map 26 shows all bus routes

that touch the study area. Superimposed in color in proportion to actual usage is the flow through the bus system. Using Map 26 as a guide, it is apparent that a number of areas attract a sizeable number of Bushwick workers that must use two buses, including the industrial sections of Maspeth, Queens, to the north, and the hospital complex in East Flatbush. Fortunately for Bushwick residents, many of these two-bus trips can be made with one fare because of free transfers. Other bus trips, however require a double fare even for relatively short distances.

Within four miles of Bushwick there exist a number of industrial concentrations, Greenpoint, Long Island City and Bush Terminal, that presently are not reached by bus by the study area residents. This is not at all surprising since bus service to these locations from Bushwick is either tortuous or nonexistent. Existing bus lines serving Bushwick can readily be extended to Maspeth and to Greenpoint. It is possible to reach those locations by subway, and it might be expected that sizeable numbers do just that. But as we will see later, most drive.

In East Tremont, where there are no free transfers, there are no particular two-fare flows that stand out, but there are many trips to scattered locations requiring two buses, and therefore, two fares. Map 26 shows this clearly. The major one-fare flows are along Boston Road and Southern Boulevard; the Bx20 travels north to Fordham Road, serving both Fordham Hospital and this major retail district and the Bx28 runs east-west through the study area, turning up White Plains Road and ultimately to Gun Hill Road, where it delivers East Tremont residents to Montefiore Hospital. Service to the emerging industrial concentrations in Hunt's Point and the South Bronx could be accomplished by the extension of a number of existing routes.

The use of free transfers by residents of the three study areas varies considerably. In Bushwick, with the most free transfers available, almost one in four bus riders takes advantage of them. Another 15 percent pay two fares. In South Jamaica, only 5 percent are able to transfer free, and almost one-third of the bus riders pay a second fare. In East Tremont, where free transfers are nonexistent, three out of ten bus riders are forced to pay two fares on journeys-to-work. These data are shown in Table 91 along with City-wide averages for Transit Authority and MABSTOA routes. The study area data and the City-wide averages are not strictly comparable, for the former are limited to work trips only, and exclude bus travel that

Map 26.

Bus Routes and Trips to Work by Bus from Bushwick* and East Tremont**

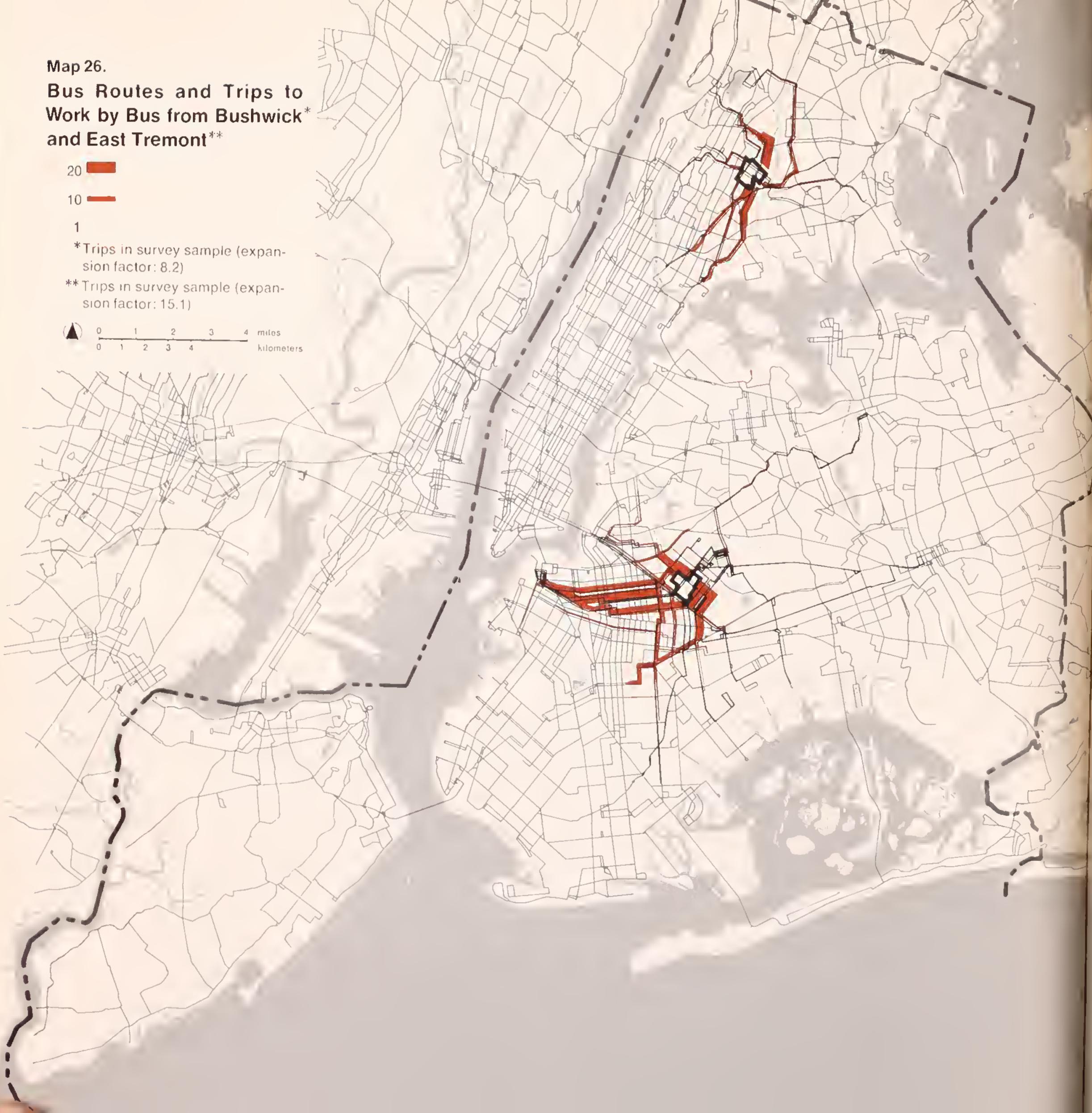
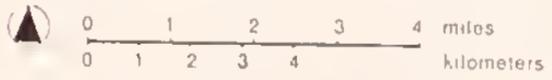
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10

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*Trips in survey sample (expansion factor: 8.2)

**Trips in survey sample (expansion factor: 15.1)



is part of a subway trip. Nevertheless, they imply two important conclusions. First, that the use of two buses on one trip is more prevalent in areas where free transfers are available. This is illustrated in two ways: more double bus usage exists on the TA system compared to the MABSTOA system, and more double bus usage exists in South Jamaica and Bushwick, where some free transfers are available, than in East Tremont, where there are none. A wider free transfer system would undoubtedly induce more double bus trips. Second, that the low-income areas appear to have a higher proportion of two-bus trips than the City as a whole. In other words, aside from the fact that the double bus fare hits the poor person's pocket-book harder, it also seems to hit it more frequently, and thus penalizes most those most dependent on the system. More generally, there is no reason to perpetuate inequities between different parts of the City--such as Brooklyn and the Bronx--which are based purely on historic accidents, i.e. the past pattern of transit route ownership.

Table 91.
Percent Bus Riders who transfer in Three Study Areas and New York City.

	Home-interview data:			System-wide averages:	
	South Jamaica	Bushwick	East Tremont	TA	MABSTOA
Two fares	32.2%	14.7%	30.3	18.4	24.4
Free transfers	5.1%	23.3%	0.0	14.0	0.0
Total using 2 buses	37.3%	38.0%	30.3	30.2	24.4

Sources: Regional Plan Association and EBS Management Consultants.

The subway trip.

The subway system of New York City was designed to serve the Manhattan Central District. Of the more than 7,000 subway trips sampled in this study, more than 6,300 were by persons destined either for the CBD or to intervening locations reached by taking a subway enroute to the CBD. This is shown clearly in Chart 32, the cumulative trip length frequency distribution curves for subway trips. Each of the three areas shows a modest percent increment for each mile increment until the distance from the CBD is reached. At that point almost all of the remaining trips are accounted for. For South Jamaica this point is the 10-11 mile increment, for Bushwick it is the 4-6 mile increment, and for East Tremont, it is the 8-9 mile increment. The segment of traffic the system does not serve well is circumferential; e.g. the trip from the Bronx or Brooklyn to Queens.

The resident of South Jamaica, as mentioned earlier, has two basic choices when using the subway system: the Independent system at Hillside Avenue or the BMT at Jamaica Avenue. As evident from Map 27 showing subway trip flows of South Jamaica workers, the choice between these is made solely on the basis of work location. If his job is in Mid-Manhattan the choice is the Independent Line, if in Lower Manhattan, the choice is the BMT. The choice can be made so clearly because each line is almost equally inaccessible, requiring a bus and a second fare to reach either. In fact, in South Jamaica 90 percent of all subway users require two fares or more.

The planned Southeast Queens extension of the Independent Line can provide a reduction in this percentage, the magnitude of which will depend upon the station location and spacing. At any rate, this extension combined with the proposed new interchange with the BMT at Twombly Place will provide new access to both the Independent Line and BMT, thereby serving residents who are destined for Mid-Manhattan, Lower Manhattan, parts of Queens, and much of Brooklyn, simultaneously.

A number of subway riders from South Jamaica apparently reach destinations in Brooklyn via the Independent Line that could be reached much more easily by using the Jamaica Avenue BMT, highlighting the need for better information, mapping and explanation of the system.

As described earlier and as Map 28 illustrates, Bushwick subway riders have considerable flexibility using the subway system. Three major flows exist. About 38 percent of all subway riders ride the 14th Street Canarsie Line, the LL service; about 30 percent ride the KK or QJ Broadway service; about 32 percent ride the KK or QJ eastbound, transferring at Eastern Parkway for the IND A or E lines. Each of the three alternatives provides service to both Mid-Manhattan and Lower Manhattan. Bushwick residents travelling to Manhattan have a choice of three relatively equivalent services and these decisions are likely to be based on such criteria as number of blocks to walk, ease of transfers and congestion on the train itself. This undoubtedly accounts for the low number of subway riders that pay two fares in Bushwick--only 19 percent.

As alluded to earlier, few Bushwick residents travel by subway to Greenpoint, Long Island City or to Bush Terminal despite the fact that it is possible to reach the first two by riding the LL to Latimer Street and transferring to the GG service.

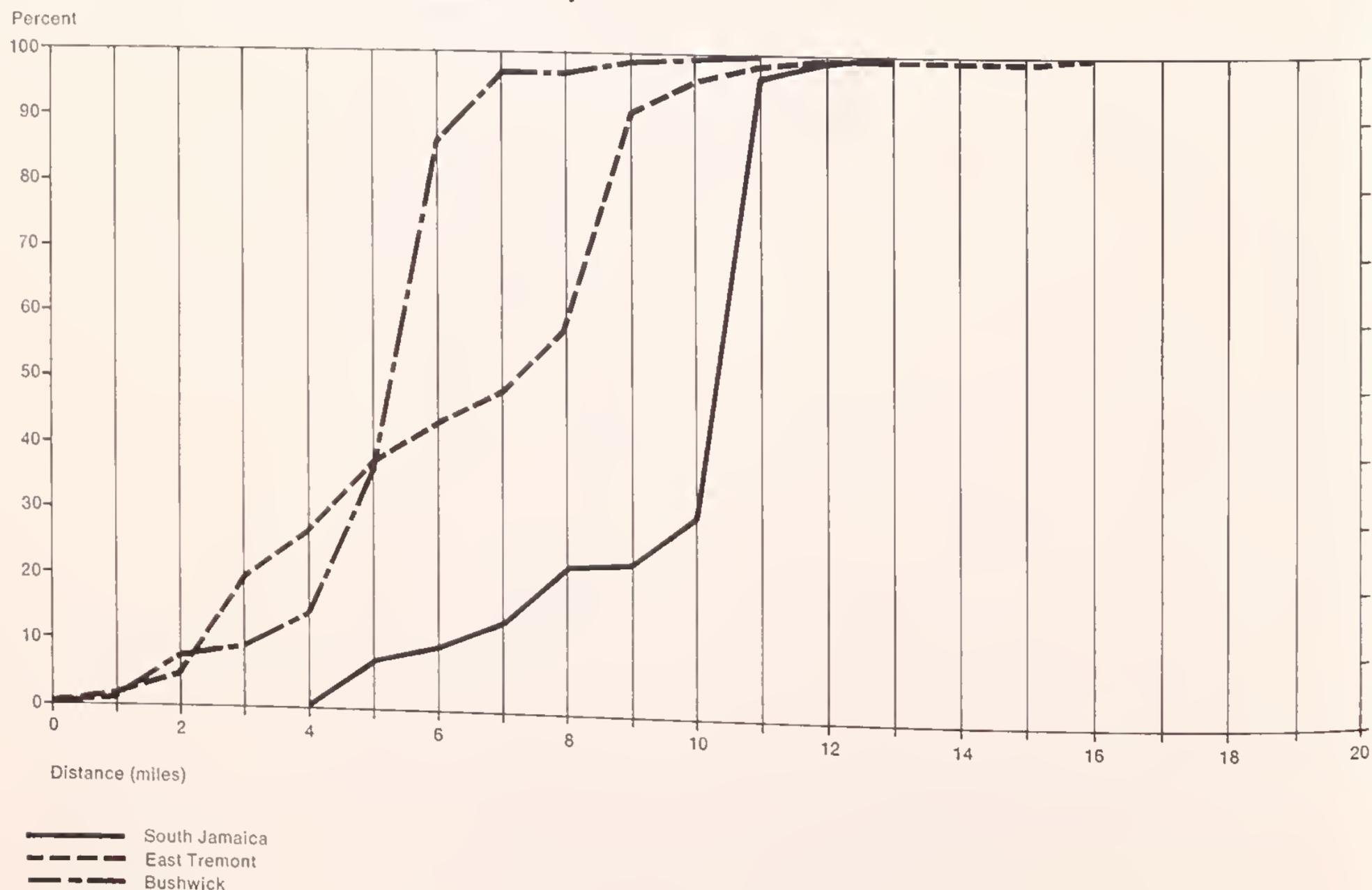
The subway usage of East Tremont, Map 29, is most notable because of the disparity in usage of the Third Avenue Line and the White Plains Road Line. Eighty-three percent of all southbound riders choose the latter despite the position of the study area squarely between the two. This is a result of the dead-end nature of the E1 requiring a transfer at 149th Street for anyone going beyond. Many people therefore choose to take a bus to the more direct line, resulting in 27 percent of the riders requiring two fares. This raises the question as to the necessity for retaining the E1 with its blighting influence if a bus service with a free transfer might provide comparable service. The decision to raze the E1 and replace it with a bus service eventually to be replaced by a subway should be considered in light of this and because of the positive redevelopment influence that could be created.

The rail trip.

The use of the railroad by study area residents is negligible. Among survey respondents, only one worker in South Jamaica and one in East Tremont were rail commuters, both going to jobs outside the City. As was pointed out in Chapter 4, reverse railroad commutation--using the existing rail system to carry residents of poverty areas to suburban counties in the opposite direction from the major commuter flow--requires sufficiently low fares to attract low-income workers, frequent and convenient schedules, accessibility to rail stations in the City, and a substantial concentration of jobs within walking distance to the suburban stations, supplemented, in most cases, by a pick-up service provided by the employer.

To measure the level of fares necessary to attract low-income workers to the railroad it is useful to ex-

Chart 32
Cumulative Trip-length Frequency Distribution, Subway



Map 27.
Trips to Work by Subway
from South Jamaica

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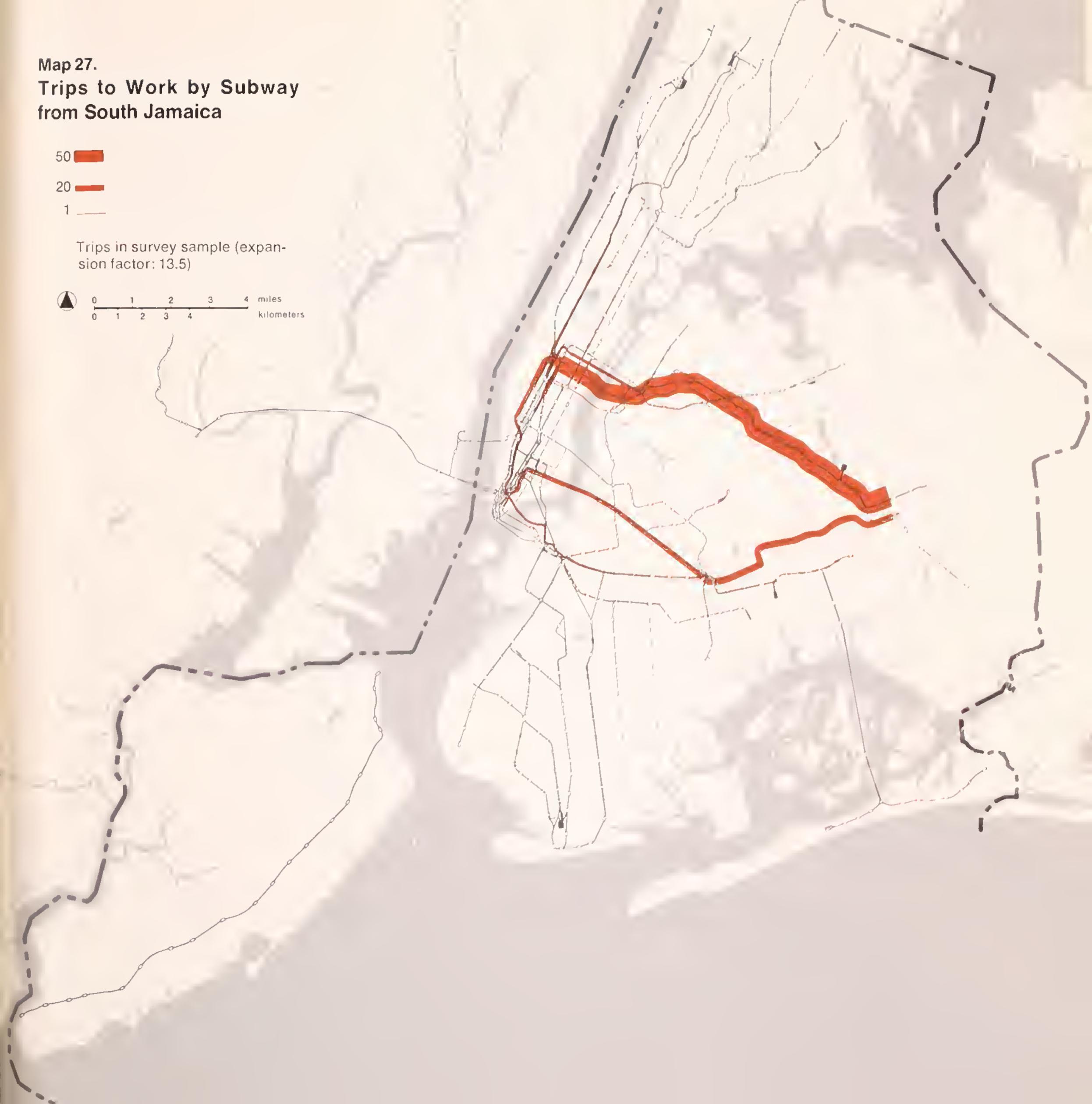
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Trips in survey sample (expansion factor: 13.5)



0 1 2 3 4 miles
0 1 2 3 4 kilometers



Map 28.
Trips to Work by Subway
from Bushwick

50



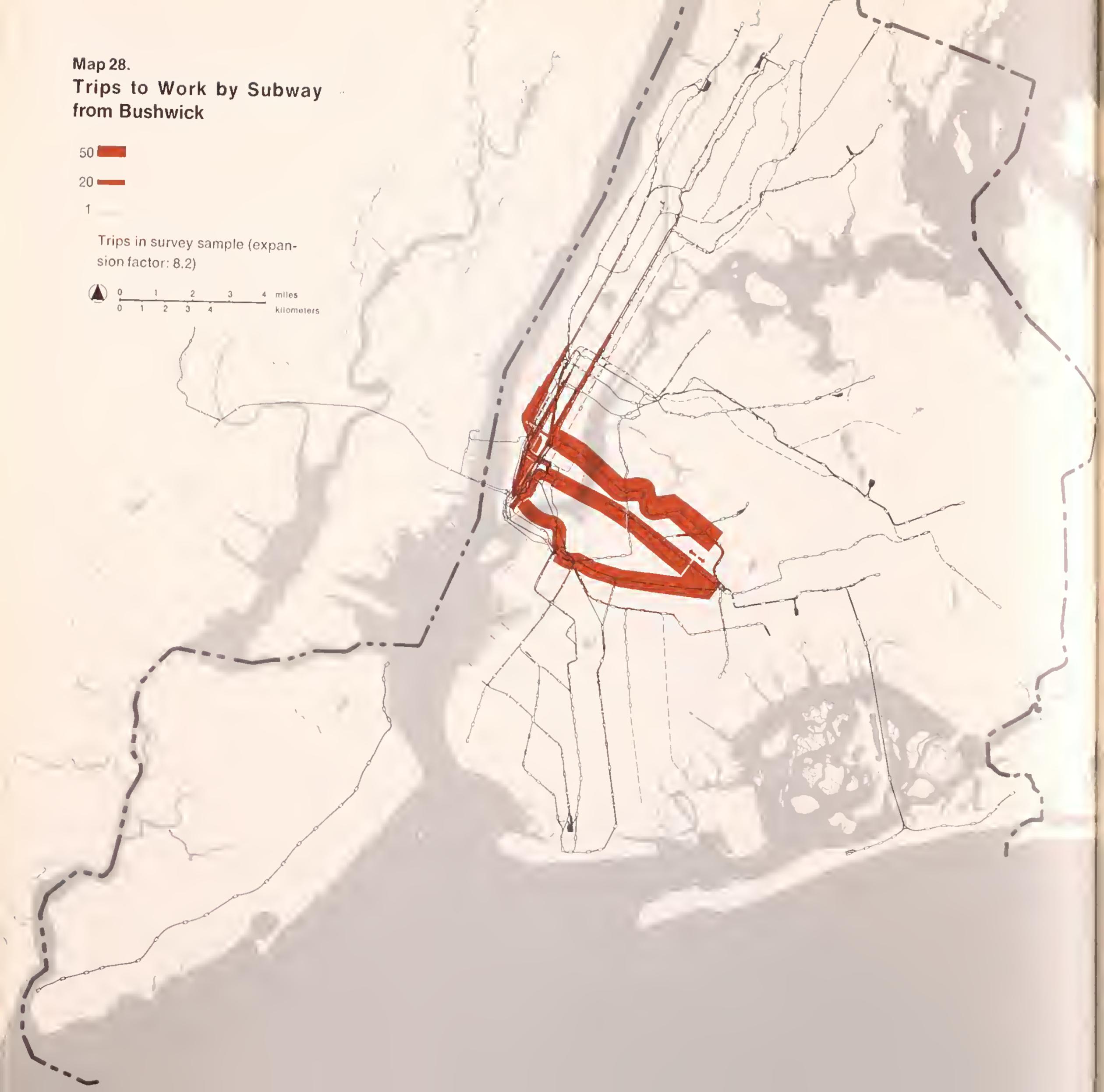
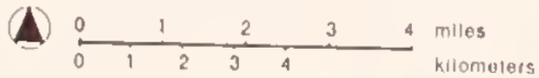
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Trips in survey sample (expansion factor: 8.2)



amine the present fares paid by those using public transportation. Table 92 shows the average one-way fare paid by residents of each of our three study areas by weekly wage, as of 1970, when a basic 30¢ bus and subway fare was in effect. South Jamaica workers paid substantially more for their transit journeys to work, averaging 52.2 cents each way, than did the residents of Bushwick or East Tremont. This is directly attributable to the large majority, 80 percent, that paid a double fare or more. Residents of the other two areas averaged about 38 cents per trip, a result of the much lower share of multiple fare trip-makers. There appears to be no significant variation of transit costs by wage rates. The lowest wage earners, by and large, pay about as much to travel to work as the higher wage earners. As Table 92 illustrates, this has a regressive result, since a larger share of the lower wage earners' salary must go toward paying their transit fares. For example, those earning from \$70 to \$100 per week, on the average, spend about five percent of their salary on transit fares. This is equivalent to a suburban resident with an annual income of \$20,000 spending \$83 per month for a commuter railroad ticket, a rate about twice as high as he now pays.

Table 92.
Transit Fares by Income in Three Study Areas, 1970.

Weekly Wage	South Jamaica		Bushwick		East Tremont	
	Ave. Fare One-way	Travel Cost as % of Wage	Ave. Fare One-way	Travel Cost as % of Wage	Ave. Fare One-way	Travel Cost as % of Wage
\$0-50	\$0.55	13.8%	\$0.40	10.0%	\$0.42	10.5%
\$50-70	0.56	9.4	0.38	6.4	0.43	7.2
\$70-100	0.48	5.6	0.35	4.1	0.44	5.2
\$100-150	0.53	4.2	0.39	3.1	0.37	3.0
\$150-200	0.52	3.0	0.39	2.2	0.35	2.0
\$200+	0.55	2.4	0.39	1.7	0.45	2.0
Average, all wages	52.2¢	3.8%	38.4¢	3.1%	38.9¢	3.0%
Percent, one fare		19.8%		78.1%		72.8%
Percent, two fares		74.9		20.0		24.9
Percent, three fares		5.3		1.9		2.3

Source: Regional Plan Association.

All this is by way of introduction to the critical question--what reverse rail fare levels should be set to enable City residents to reach suburban jobs without excessive costs? If the assumptions are made that the available blue collar semi-skilled jobs in the suburbs pay on the order of \$6,000 annually, or \$120 per week, and it is assumed that a worker is prepared to pay no more than 5 percent of his salary on trans-

portation to work, then Table 93 shows how far into the suburbs he can get under the existing monthly commutation, a 33 percent discount, and a 75 percent discount, from each of four rail stations in the City, first assuming an additional 35 cents bus or subway fare and then assuming no additional costs getting to and from the rail stations at either end of the trip. Reverse rail commuting to New Jersey sites was not considered here since at least a 35 cents fare and 30 minutes of travel are required to reach the terminals in the Manhattan Central Business District from the low-income areas of New York City. Reverse commuting by bus to points in New Jersey is a possibility and will be discussed later.

It is clear that poverty area residents are not really able to use the railroad given present commutation rates if they must pay 35 cents to reach the station. Only if they can walk to the rail station can they use the system with no discount and then only as far as Hartsdale in southern Westchester; Long Island destinations are still out of the question. With a 33 percent discount, help is given to those who can walk to the station in Westchester but Nassau County is still beyond the reach of Jamaica and Brooklyn residents. Those who must pay a 35 cents fare to reach the railroad station have still not improved themselves. Only with a 75 percent discount, walkers have reasonably priced access to all of Westchester, Nassau and Suffolk counties. Non-walkers still are extremely limited with respect to Long Island destinations.

City-wide, only 13 percent of the poverty areas are within reasonable walking distance of the rail stations. For those beyond walking distance, a subway or bus ride costing 35 cents, in addition to the usual fare, will seriously curtail reverse commuting even with a 75 percent discount.

One can argue that such discounts can be provided without difficulty, since the marginal cost of providing reverse commutation capacity is small. The view of the railroad managements is that operational procedures placing extra conductors on trains, the stopping of trains, and their schedules, would require changes that would incur added costs, and that discounts are only possible if subsidized separately by State or Federal governments. However, as described in Chapter 4, the added number of passengers would be small, and thus there would be no additional operating cost to the railroads for additional seating because empty seats are now available in rail cars presently covered by conductors. The only losses would be losses in fares from existing reverse commuters.

Map 29.
Trips to Work by Subway
from East Tremont

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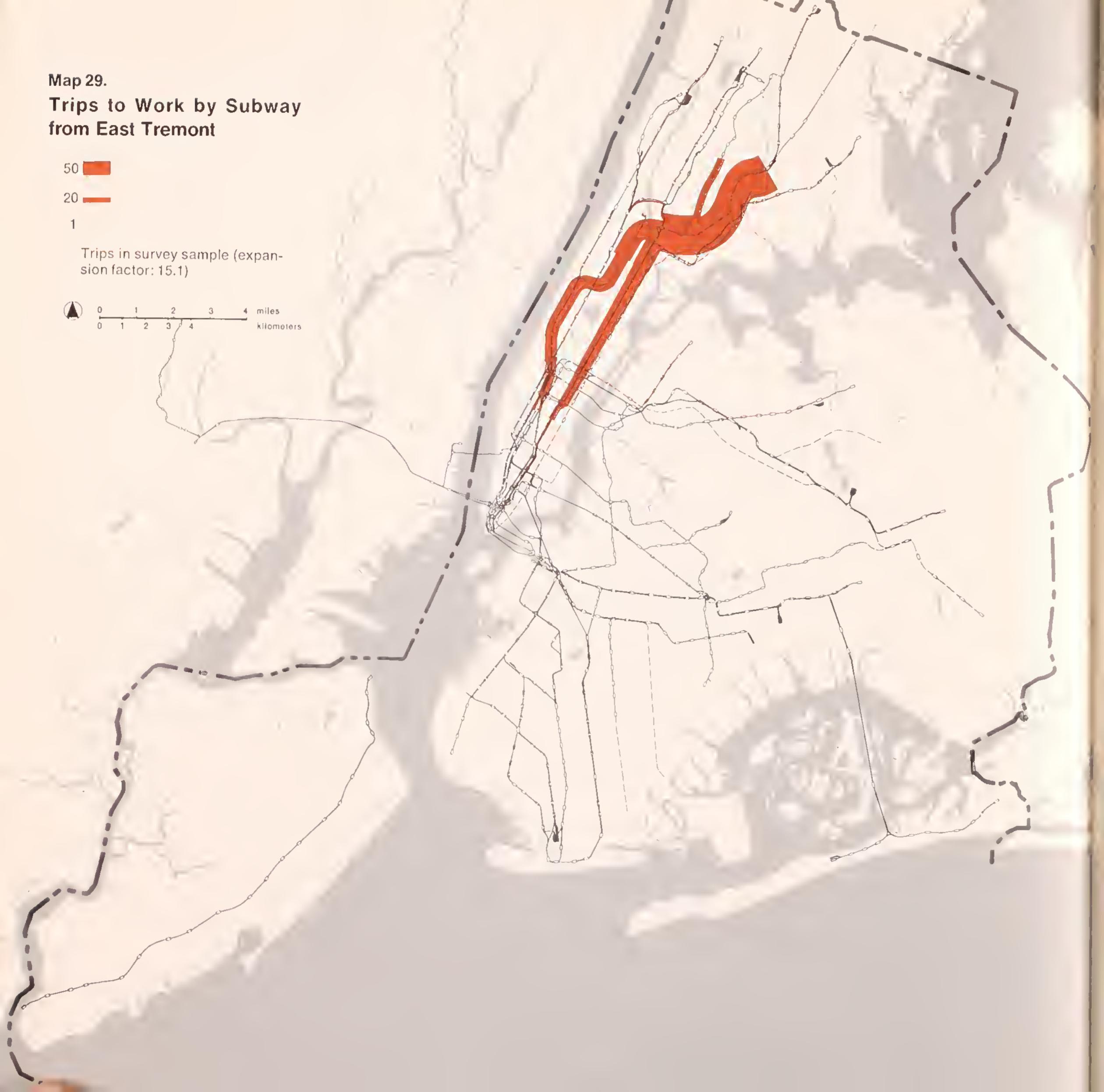


1

Trips in survey sample (expansion factor: 15.1)



0 1 2 3 4 miles
0 1 2 3 4 kilometers



The second objection often raised is that discounts to one class of travellers--those travelling in the reverse direction--discriminates against the user of the railroad in the major direction. In reality, it appears more equitable that those causing the major cost of operation should pay the bulk of that cost. To some extent, Penn Central Railroad has recognized this principle; special discount fares are already in effect for off-peak travel. To facilitate the sales of discount commutation tickets, all such tickets would be valid in the appropriate reverse commuting direction at the appropriate times for rail stations in poverty areas. The loss in revenues resulting from a 75 discount would amount to about 2 percent rail revenues and would be partially offset by the increase in patronage.

By and large, the frequency of existing rail service capable of serving reverse commuters is good. Harlem residents have at least four schedules in each direction serving Mt. Vernon, White Plains and Tarrytown with approximate running times of 25, 40 and 30 minutes, respectively. South Bronx residents have similar service to Mt. Vernon and White Plains with running times of about 15 minutes to the former and 25 minutes to the latter, although some of the White Plains' schedules require an across-the-platform transfer at Mt. Vernon. The one glaring deficiency is that no New Haven trains stop in the Bronx, shutting off service to the employment concentrations in eastern Westchester and Connecticut that tend to be substantially closer to the railroad stations than the ones along the Harlem and Hudson Divisions. At least three trains that presently pass by the low-income areas in the morning and evening should stop there.

Service frequency for residents of Central Brooklyn and Jamaica are reasonably good. Six schedules a day in each direction serve Mineola and Hicksville, with running times ranging from about 15 minutes between Jamaica and Mineola up to 45 minutes from

Central Brooklyn to Hicksville. However, only two trains during the peak period each way serve Bethpage, Republic and Farmingdale. Grumman has but one, Westbound services in the evenings, which overtime workers might avail themselves of, is generally good at most other stops but at Grumman and Republic Stations no service exists after 4:28 and 5:00 P.M., respectively.

Of course, even should the fare be low enough and schedules frequent enough to attract substantial numbers of City residents, sufficient job openings must be available within walking distance of the rail stations. Alternatively, a pick-up service to meet each train would be provided by the employer. To examine these possibilities, the location of industrial sites in relation to the rail stations was explored.

The job sites in the industrial spine of central Nassau County are generally beyond a reasonable walking distance of the suburban rail stations. The Mineola station is within 2000 feet of some industrial sites on Second Street, but even there the bulk are one-half mile or more away. The East Williston station on the Oyster Bay Branch shows up somewhat better with a substantial number of sites about one-third of a mile away in the vicinity of Jericho Turnpike and Sagamore Avenue but these sites are generally low-intensity warehousing. Other industrial concentrations such as along Stewart Avenue in Hempstead, Grand Boulevard in New Cassel and east of Union Road in Plainview are all considerably more than one mile from the nearest rail station.

Beyond Hicksville, two rail stations, Grumman and Republic, show large concentrations of industry within walking distance. The Grumman station is surrounded by plants of the aircraft company. Twenty to twenty-five persons use the railroad each weekday (22 on the day counted). Of these about one-third live in Queens, one-third in Brooklyn and one-third in Nassau County. Grumman provides a minibus for its workers from a number of the plant locations. Rail

Table 93.
How Far City Residents can Travel by Rail Under Various Fare Options, Spending no more than 5% of a \$120 Weekly Wage

From	No Discount		33% Discount		75% Discount	
	35¢ Access Cost	No Access Cost	35¢ Access Cost	No Access Cost	35¢ Access Cost	No Access Cost
125th Street, Manhattan	Nowhere	Nowhere	Nowhere	Scarboro Thornwood	Chappaqua Oscawana	Brewster Cold Spring
Tremont, the Bronx	Nowhere	Hartsdale	Hartsdale	Golden's Bridge	Croton Falls	Brewster
East New York, Brooklyn	Nowhere	Nowhere	Nowhere	Nowhere	Nowhere	Bridgehampton Greenport
Jamaica, Queens	Nowhere	Nowhere	Nowhere	Union Hall St.	Queens Village Rosedale	Montauk Greenport

Note: Long Island Railroad fares based on proposed January, 1972 fare schedule
Source: Regional Plan Association.

service is limited to one schedule each way coinciding well with the working hours at Grumman. The Republic stop on the railroad offers one morning and two afternoon schedules that serve approximately 25 workers of the Fairchild plant. Of course, in the present economic climate, job openings are likely to be extremely limited.

There are numerous plants along Route 110 in Farmingdale in the vicinity that could be reached by bus from the Republic station. However, given the previous discussion concerning the limitations placed on reverse commuting by additional access costs, the potential is limited if the rider is to pay for this bus service as well. The present fare to each of these stations is in excess of \$1.00 per ride based on a monthly commutation from Jamaica, Queens, Flatbush Avenue in Brooklyn or Pennsylvania Station in Manhattan. However, in conjunction with a discounted fare, the service to these two stations could be made substantially more attractive. For example, Grumman could have an additional afternoon train stop, from among the many that presently go through the station.

The reverse bus trip.

The potential for reverse bus commutation is worthy of consideration. Numerous bus routes exist from Nassau County feeding Jamaica Center. As a result, about 100 South Jamaica residents who work in Nassau travel there by bus. They generally pay less than a 60 cents one-way fare to reach such Nassau locations as Freeport, Valley Stream and New Hyde Park, excluding any cost of reaching Jamaica Center. Bee Line routes # 4 and 6 to Freeport and Hempstead, respectively, offer about 5 buses an hour for the reverse commuter. Considerably less frequency is provided to the Mineola-Hicksville axis of Nassau County. The bus system to Nassau County is useful in providing access at somewhat less cost than the present Long Island Railroad fares to the spread job locations.

In Bushwick, no workers were found to use the bus for reverse commuting. In view of the earlier discussion of the bus trip length distribution (Bushwick is about 10 miles from the City border), this is hardly surprising.

A similar lack of reverse bus usage uncovered in the home interviews in East Tremont is somewhat more surprising. Only one person (representing some 15 workers) was recorded as using a bus to commute -- in that case to Yonkers. Reverse bus commuting to

New Jersey from the poverty areas of the Bronx and Upper Manhattan appears to have considerable potential provided the service is not slowed by city traffic. In this regard, the use of the George Washington Bridge Bus Station (GWBBS) at the eastern end of the George Washington Bridge, is critical. It can serve as a collection point from the low-income areas of northern New York City (and other areas as well).

At present, the GWBBS does not afford good access from East Harlem or the Bronx. Central Harlem residents can reach it easily using the Eighth Avenue Independent subway, but East Harlem and many Bronx residents must take at least three trains or spend two fares just to reach the terminal. Fortunately, because excellent data exist for the trip characteristics of the users of the GWBBS,* it is possible to assess the negative effect of East Harlem's inaccessibility. Port of N.Y. Authority data show that in 1968, peak period work trips from the Central Harlem zone to New Jersey via the GWBBS was 9.7 times greater than from the East Harlem zone. Adjusting for the fact that the population of the Central Harlem zone is 1.98 times greater than that of the East Harlem zone, we can conclude that Central Harlem residents are 4.9 times more likely to use the GWBBS than residents of East Harlem. In other words, if access equal to Central Harlem's in time, cost and amenity was provided to East Harlem, five times as many East Harlem residents as presently use the GWBBS would use it to travel to work.

Before considering how this could be achieved, the same analysis can be applied to the Bronx. There, two reporting zones of the Port Authority that include low-income areas reveal that the factors would be 1.7, and 4.7, the first for a zone in the west Bronx straddling the Cross-Bronx Expressway and including all the Bronx low-income areas north of 161st Street, the second, to the south, including the remaining low-income areas of the Bronx.

The key problem to be faced now is how to provide access to the GWBBS for East Harlem, the Central and South Bronx, comparable to that of Central Harlem. In East Harlem, the answer could be the extension of some of the bus lines running north-south along the avenues that presently terminate in Harlem. Some routes terminating in the South Bronx could also

* This is in sharp contrast to the limited data available for reverse commutation usage from the railroads.

be extended to the GWBBS. Most of these extensions and additions to the bus network would be able to use portions of the expressway network, particularly the Harlem River Drive, thus expediting the service.

In the Central Bronx, including our East Tremont study area, there are 3 routes, Bx11, Bx35, Bx36, known as the 170th Street Crosstown, the 167th Street Crosstown, and the 180th Street Crosstown respectively. All currently serve Washington Heights with their western terminus at 180th Street and Broadway, two blocks north of the GWBBS. Each has a complicated and long route through the low-income areas of the Bronx, diminishing its attractiveness for serving the GWBBS. As a minimum, these routes should stop directly in front of the GWBBS.

Analysis of the New Jersey destinations of the reverse bus commuters through the GWBBS shows that among the municipalities in Bergen and Passaic counties that have substantial concentrations of employment, only three destinations stand out as having sizeable numbers of commuters using the GWBBS. They are Paramus, Hackensack and Paterson. Trips to such employment concentrations as South Hackensack, Moonachie, Teterboro and Carlstadt are negligible. Generally this is because service to these places is poor or nonexistent. The use of express buses directly to these concentrations, using Interstate 80, a highway free of congestion which passes through or near all the municipalities listed should be tried.

The Port Authority Bus Terminal (PABT) at 41st Street and Eighth Avenue certainly cannot be overlooked as a terminal for reverse bus commuting. In fact, reverse work trips in the peak period in 1968 totalled 5,620, more than twice the comparable number as the GWBBS. Almost half (47.1 percent) live in Brooklyn or Queens, 21 percent in Upper Manhattan, and 13 percent in the Bronx. Two-thirds of these trips are destined for Hudson County, Newark, and the industrial areas on the edges of the Hackensack Meadows. The remainder are scattered throughout northern New Jersey. However, the possibility of improving reverse commuting by improving either the already good service to the large traffic generators or the already good access to the Terminal via the subway system for New York City residents, is small.

The auto trip.

As was mentioned previously, and is shown again in Table 94, some 40 percent of all work trips in the study areas are made by automobile, and this proportion is close to 50 percent in South Jamaica and East

Tremont. Quite plausibly, the last column in Table 94 shows that over 80 percent of all trips from the study areas destined beyond the City boundary are made by auto; 43 percent of the trips to New York City destinations outside the CBD are by auto; but, rather surprisingly, as many as 28 percent of the trips to the CBD were also reported to be by auto. Some of this may have to do with odd schedules of the workers involved (night shifts, etc.). Altogether, 90 percent of all automobile trips to work from the study areas were within New York City, predominantly to destinations other than the CBD.

To explore this surprisingly high rate of automobile use--substantially higher than that recorded by the 1960 Census--it is appropriate to look at auto ownership and use characteristics, as presented in Table 95. It is evident that auto ownership is highest in South Jamaica, with 60 percent car-owning households, followed by East Tremont with 37 percent and Bushwick with 27 percent. Over the 1960 to 1970 de-

Table 94.
Auto Work Trip by Destination in Three Study Areas.

Destination	South Jamaica	Bushwick	East Tremont	Total	Percent Auto to Destination
Manhattan CBD	15.7%	12.4%	21.8%	18.9%	27.8%
Other NYC	73.5	80.0	67.4	70.6	43.2
Outside NYC	10.8	7.6	10.8	10.5	81.4
	100.0	100.0	100.0	100.0	40.9

Source: Regional Plan Association.

Table 95.
Auto Ownership and Use Characteristics in Three Study Areas.

	South Jamaica		Bushwick		East Tremont	
	No.	%	No.	%	No.	%
Household Owning: ^a						
No Auto	177	40.0	671	72.8	661	62.8
One Auto	210	47.5	246	23.4	367	35.0
Two or More	55	12.5	35	3.8	25	2.2
Total Households	442	100.0	952	100.0	1,053	100.0
Total Autos Owned	324		317		420	
Autos/Household, 1970	0.73		0.33		0.40	
Autos/Household, 1960	0.79		0.46		0.37	
Job-Holders	421		591		869	
Job-Holders Using Auto	201		106		330	
Owner Driven	180		92		292	
Passenger in Auto of Same Household	10		1		10	
Passenger in Auto of Other Household	11		13		28	
Percent of Available Autos Used for Work Trips ^b	59.0%		33.1%		76.2%	
Percent Work Trips by Auto, 1970	47.8		17.9		49.4	
Percent Work Trips by Auto, 1960	35.3		14.4		16.8	

^a Unexpanded sample.

^b Owner driven plus passenger in auto of other household as percent of total autos owned.

Sources: Regional Plan Association and U.S. Census, 1960

cade, this ownership rate has remained virtually unchanged, dropping slightly in South Jamaica and Bushwick, rising slightly in East Tremont. However, the percent of all trips to work that are made by auto has risen dramatically, as shown at the bottom of the table. This can only be explained by an increasing use of available autos for travel to work. Certainly, the percentages shown in line 13 of Table 95, indicating the proportion of available autos used for travel to work in 1970, do not seem unreasonable, ranging from 76 percent in East Tremont to 33 percent in Bushwick. It is also evident that the number of auto passengers (rather than drivers) amounts to only 9 to 15 percent of all auto users, indicating the minor importance of car pooling.

How poverty area residents use the automobile for work trips is of obvious interest. The trip length, travel time and speeds by auto for the study area residents is most important, especially as to how it compares with the public transportation characteristics.

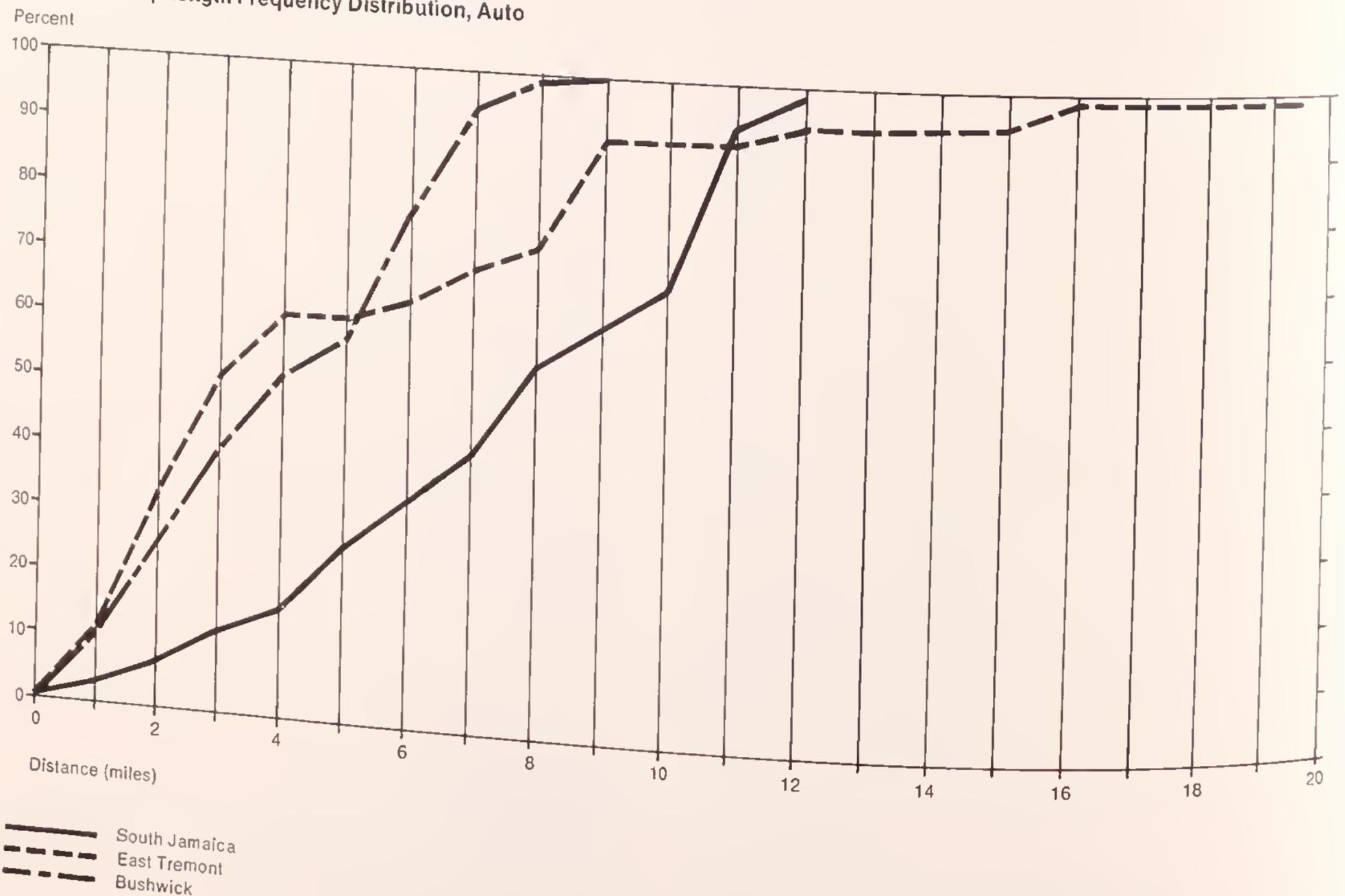
Therefore, the automobile cumulative trip length frequency distribution for each study area is depicted in Chart 33. The geographic position of the study areas and their surrounding density of opportunities is reflected in the figures: South Jamaica, being farthest from the CBD, had the longest median auto trip (50 percentile), 7.6 miles. By contrast, East Tremont's median trip length is only 3.0 miles. Comparisons of auto and transit work trip characteristics for the three study areas are shown in Table 96.

Table 96.
Auto and Transit Work Trip Characteristics in Three Study Areas.

	South Jamaica		Bushwick		East Tremont	
	Auto	Transit	Auto	Transit	Auto	Transit
Median Trip Length (miles)	7.6	10.0	3.8	4.1	3.0	4.0
Average Trip Length (miles)	7.2	7.4	3.8	4.1	4.9	5.7
Average Time (minutes)	42.2	58.6	32.6	52.0	32.4	45.3
Average Speed (mph)	10.2	7.6	7.0	4.7	9.1	7.5

Source: Regional Plan Association.

Chart 33
Cumulative Trip-length Frequency Distribution, Auto



It is evident from Table 96 that transit trips tend to be of slightly greater distance than auto trips, perhaps in the order of one-half mile, and that transit travel time averages on the order of 15 minutes longer than auto time. Consequently auto travel speeds are from 20 to 50 percent faster than transit travel speeds. Of course, it should be recognized that the transit data include both bus and subway travel; buses are slower and subways faster. While the use of the automobile may afford considerable travel time savings and explain the high usage of the automobile, the opportunities for higher incomes that the automobile may provide is worthy of exploration. Let us then investigate the relationship between income, auto ownership and its use for the work trip.

Earlier, in Chapter 2, it was shown that the proportion of low-paying jobs in the City was greater than in the suburbs, suggesting that the lack of an automobile, which in many cases provides the only access to such jobs, prevents the poor from earning more. Conversely, better paying jobs make it financially easier to own an automobile, and so a self-reinforcing cycle appears in which the poor are left with poorer jobs and fewer automobiles. To shed some light on this question, Table 97 was prepared showing the average weekly earnings of four categories of workers: those who use an auto to travel to work and those who use transit, each subdivided according to whether the household they belong to does or does not have an auto.

It is clear from Table 97 that auto users owning autos earn substantially more than transit users who do not own an auto, the difference ranging from \$19 a week in East Tremont to \$43 a week in Bushwick. Of course, this finding is not very conclusive with regard to cause and effect--it can be simply interpreted that the workers with higher earnings own and drive an auto because they earn more. A somewhat better idea of how much of the earning difference is due to the use of the automobile might be derived from comparing auto owners who drive with auto owners who go by transit. Here the difference is smaller, but still noticeable, averaging \$20 per week for both sexes. For men only, the difference averages about \$12 per week, which still tends to more than cover the added cost of driving if no parking fees are involved. Here again, though, the difference may be due to the fact that those who earn more prefer to spend a part of the added income on the comfort of driving. Thus, the third comparison is between non-owners of automobiles who take transit and those who drive to work. The sample in the second column of Table 97 is very

Table 97.
Earnings, Auto Use and Ownership in Three Study Areas.

South Jamaica:	Mode Used:	Auto		Transit	
	Own Auto:	Yes	No	Yes	No
Both Sexes					
Weekly Earnings		\$150	\$119	\$131	\$117
Number in Sample		126	5	105	97
Male					
Weekly Earnings		\$150	\$128	\$143	\$123
Number in Sample		95	3	50	52
Female					
Weekly Earnings		\$149	\$105	\$120	\$111
Number in Sample		31	2	55	45
Bushwick:					
Both Sexes					
Weekly Earnings		\$154	\$137	\$127	\$111
Number in Sample		66	12	127	251
Male					
Weekly Earnings		\$156	\$139	\$134	\$117
Number in Sample		50	7	71	128
Female					
Weekly Earnings		\$150	\$135	\$110	\$106
Number in Sample		18	5	66	123
East Tremont:					
Both Sexes					
Weekly Earnings		\$142	\$137	\$125	\$123
Number in Sample		246	16	111	253
Male					
Weekly Earnings		\$145	\$144	\$133	\$128
Number in Sample		221	14	71	183
Female					
Weekly Earnings		\$119	\$ 85	\$111	\$111
Number in Sample		25	2	40	70
Average, male		148	140	136	123
Average, female		139	117	117	108
Average, both sexes		\$146	\$134	\$128	\$117

Source: Regional Plan Association.

small, and insufficient to make firm judgments, but it shows consistently, in all three areas, male wages of non-auto owners being driven to be higher than those of non-auto owners using transit.

In connection with non-auto owners being driven, a brief discussion of the subject of car pooling is in order. As was shown in Table 95 earlier, in South Jamaica, 10 percent of the auto users were passengers, in East Tremont, 12 percent and in Bushwick 13 percent. These small numbers reflect the scatter of car-accessible work sites which make car pooling impractical, the dearth of very large establishments, and the general inconvenience of car pooling which is essentially public transportation with a service frequency of one. These disadvantages apparently outweigh the cost-sharing advantages of car pooling.

Theoretically, the amount of car pooling likely to occur between poverty areas in the City and industrial locations in the suburbs will be in proportion to the density of workers living in close proximity to one another and simultaneously to the density of those

working in close proximity if not in the same plant, at least in the same square mile. Accordingly, an examination was made of the potential for car pooling from four poverty areas in the City to four employment concentrations in suburban counties. The number of potential car pool participants was estimated for these sixteen NYC to suburban county flows in Table 98.

The table shows the total Borough-to-County work trips based on the 1960 Census, the percentage of them which might originate in an average low-income square mile, and finally, assuming that the density of jobs in a suburban manufacturing concentration is 20,000 per square mile, (a moderately high density characteristic of industrial parks) and what share such a square mile is of the total county, the number of potential car pool candidates per square mile. These candidates are workers who are estimated to live in the same square mile in the City and work in the same square mile in the suburbs. It is evident from this theoretical exercise that the car pool potential is rather meager particularly in South Jamaica and Cen-

tral Brooklyn. The most favorable situation seems to exist between the Bronx and southern Westchester, but there, car pooling could be in competition with reverse rail use.

How study area residents view their transportation.

The discussion in this chapter until now has been based on the analysis of facts from a variety of sources, but particularly the home interviews. This "objective" data is distinguishable from the subjective reactions that the study area residents showed in responding to the first question about "transportation problems." The former reflects people's actual response to the transportation system in the form of their behavior, the latter is their verbal response, which gives another perspective to poverty area transportation problems.

Table 99 shows the response by the interviewees to the open-ended transportation question. A small percentage of respondents, similar among the three study areas, described the system as satisfactory. The ranking of negative comments from area to area was similar, e.g. "costs too much" ranked high, "too much walking" ranked low. Third, dissatisfaction was expressed consistently less often in East Tremont than in the other two study areas. Given these consistencies the exceptions to them are of great interest. Unlike the other two areas, residents of East Tremont ranked "too crowded" and "too dirty" high, even above "costs too much." This suggests either a greater concern with such amenity or, more likely, greater lack of amenity there. Reliability of the transportation system was of much greater concern in South Jamaica than elsewhere. Given the greater reliance on the bus network and the restricted choice of mass transit lines in South Jamaica, this is hardly surprising. Conversely, "too much transferring" is of very little concern to Bushwick residents, perhaps as a result of a number of free transfers that do exist in the area.

However, looking at such results on an aggregated basis by study area could mask considerable variation within the study area. For example, the percent of the residents voicing an objection to high costs may vary by their location within the study area relative to the subway stations and bus lines, by their income and by the travel mode they use. To isolate these factors the responses to the first question were disaggregated by residents' location, earnings and travel mode. Intuitively, it seemed likely that those some distance from the mass transit stations (in "two-fare

Table 98.
Estimated Car Pool Potential of Low Income Areas.
(Sixteen Selected Flows).

Low Income Area	Borough to County Work Trips	% Borough Low Income Labor Force Living in Average Low Income Sq. Mile	Low Income Car Pool Candidates per Square Mile
South Jamaica			
Suburban County			
Nassau	17,150	1.0%	9.5
Western Suffolk	990	1.0	1.8
Bergen	690	1.0	0.4
Southern Westchester	830	1.0	0.8
Low Income Area			
Central Brooklyn			
Suburban County			
Nassau	5,950	3.3	10.8
Western Suffolk	700	3.3	3.7
Bergen	1,450	3.3	4.3
Southern Westchester	830	3.3	2.6
Low Income Area			
South and Central Bronx			
Suburban County			
Nassau	1,360	8.6	6.1
Western Suffolk	180	8.6	1.8
Bergen	1,950	8.6	14.5
Southern Westchester	9,770	8.6	78.5
Low Income Area			
Harlem			
Suburban County			
Nassau	2,130	5.7	6.8
Western Suffolk	280	5.7	1.8
Bergen	2,860	5.7	14.0
Southern Westchester	2,550	5.7	13.5

Source: Regional Plan Association.

zones") would be more negatively disposed toward the system, particularly with regard to cost, travel time, waiting, transferring and walking.

The results of the disaggregated analysis by residential location belied intuition. In all three study areas and for all items dissatisfaction with the system appeared to be independent of location, with one exception. Residents on the western side of the East Tremont study area were substantially more negative about transferring in the system than were their neighbors to the east. This finding reinforces the earlier discussion concerning dissatisfaction with the Third Avenue El. The lack of geographic difference within South Jamaica and Bushwick is probably explained by the more uniform service within each of these two areas, poor in South Jamaica, generally better in Bushwick.

The responses to the first question were disaggregated by travel mode and by income. These were derived by associating the response of the interviewee

with each work trip listed on that questionnaire, an assumption that may not be precise but nevertheless should give a strong indication of variations. Table 100 shows the percent of households by mode and by income who voiced satisfaction with the trip to work by a "trip OK" response.

It is plain that few persons are completely satisfied with their work trip. Only one of seven auto users and one in twenty-four transit users were so satisfied. It is interesting to note that the least dissatisfaction with the automobile occurred in South Jamaica, the least dense of the three areas. Conversely, South Jamaica expressed the greatest dissatisfaction with the transit system. Among jobholders earning less than \$100 per week there existed a slightly lower degree of satisfaction than those earning above \$100 per week, although not consistently in all three areas. However, this seemingly small difference masks the fact that jobholders in households who expressed satisfaction earned an average of \$21 more per week than those expressing dissatisfaction, \$149 to \$128. This apparent discrepancy results from the skewed distribution of income to the high side for the satisfied respondents.

As we have seen earlier, those earning more tend to use the automobile more. Therefore the top part of Table 100 does not fully reflect whether people are more dissatisfied when they use a particular mode or if they are generally dissatisfied with everything around them if they are very poor, or both. Stratification by income and travel mode simultaneously, shown in the bottom part of Table 100, supplies these answers. It is obvious that auto users, whether they earn under or over \$100, are substantially more satisfied than transit users. In general, low earners within a particular mode, appear to be about as equally dissatisfied with transportation as those earning more.

While the examination of "trip OK" responses provides some measure of resident opinion of transportation, analysis of such replies as "costs too much" may be of more direct value. Table 101 shows the percent of jobholders whose household response included "costs too much," by travel mode and by income.

The expense of travelling to work is apparently felt about equally for both auto and transit users. South Jamaica transit users, reacting to their higher incidence of two fares, complained more of transit costs than those of the other areas. Bushwick auto users showed the highest negative response to costs. For the income stratification, higher-income South Jamaica residents complained substantially more about

Table 99.
Evaluation of Transportation Service by Study Area Residents.

	South Jamaica		Bushwick		East Tremont	
	%	Rank	%	Rank	%	Rank
Trip OK	13.4%	—	14.5%	—	12.3%	—
Cost too much	66.4	1	64.9	1	47.5	3
Too long	57.2	2	53.8	3	45.7	4
Too much waiting	56.5	4	51.6	5	39.5	5
Too much transferring	24.6	9	15.4	10	21.2	9
Too much walking	22.2	10	21.0	9	23.7	8
Unreliable	44.0	8	26.0	8	20.7	10
Not enough night service	45.6	7	46.7	6	31.0	7
Too crowded	57.0	3	55.0	2	59.8	1
Too dirty	56.3	5	51.7	4	50.2	2
Unsafe	50.1	6	40.7	7	39.2	6
No public transportation	n.a.	—	1.3	12	15.2	11
Directions not clear	n.a.	—	3.2	11	10.3	12
Total responding	432		904		979	

n.a. — Not asked.

Source: Regional Plan Association.

Table 100.
Percent of Households Satisfied with the Trip to Work by Mode, by Income, in Three Study Areas.

	Auto Users	Transit Users	Under \$100	Over \$100
	South Jamaica	21.7%	2.9%	14.5%
Bushwick	8.9	3.6	2.4	5.2
East Tremont	11.5	5.7	5.0	9.2
Combined average, three areas	13.9	4.2	6.0	7.9
	Under \$100	Over \$100		
Auto Users	18.3%	13.2%		
Transit Users	3.3	4.6		

Source: Regional Plan Association.

Table 101.
Percent of Households Dissatisfied with the Cost of Travel to Work by Mode, by Income, in Three Study Areas.

	Auto Users	Transit Users	Under \$100	Over \$100
South Jamaica	34.1%	54.7%	24.6%	52.5%
Bushwick	69.3	49.7	59.4	50.6
East Tremont	38.9	38.7	48.9	35.7
Combined average, three areas	42.5	46.9	47.7	44.6
	Under \$100	Over \$100		
Auto Users	46.7%	42.0%		
Transit Users	48.0	46.2		

Source: Regional Plan Association.

high costs than their lower paid neighbors, while the other two areas showed the more expected results, poorer people are more sensitive to costs. This ap-

parent contradiction in South Jamaica may be partially explained by the fact that in South Jamaica a somewhat greater percent of workers earning over \$100 who use transit pay two fares than those earning under \$100. The other explanation may be differing mode choices of the two income groups. Therefore, the "costs too much" responses were stratified by mode and income simultaneously just as had been done for the "trip OK" responses. From the lower part of Table 101 we see that on the average for both income groups, auto users are only a little less dissatisfied with costs than transit users. It seems that neither variation in income nor in travel mode produce any significant difference in complaints about costs. The fact remains the costs are burdensome to many.

NOTE ON SAMPLING RELIABILITY.

The sampling accuracy of a survey can be estimated by the following equation:

$$y = \frac{1624}{(x^{0.4884}) (\% \text{ DU})}$$

where y = root-mean-square error (68.3 percent confidence range)

x = total universe sampled

$\% \text{ DU}$ = percent dwelling units sampled.

This equation can be applied to the three home interview surveys to calculate the range of confidence of any volume quoted in the survey results. For example, there is roughly a two-thirds probability that an expanded volume of 5,000 (trips, jobs, or anything else) will be correct within \pm 9.3%, 7.3% and 9.9% for South Jamaica, Bushwick and East Tremont, respectively. An expanded volume of 500 would have corresponding errors of 28.8, 22.5, and 30.7, respectively, for the three study areas, given two-thirds confidence limits.

QUESTIONNAIRES

EMPLOYER QUESTIONNAIRE

1. How many persons do you employ at this address? _____
2. How many shifts do you have? _____
3. What are the hours per each shift? _____
4. How many persons work in each shift? _____
5. Do inadequacies of public transportation cause any of the following?

	<u>Yes</u>	<u>No</u>
Recruiting difficulties	_____	_____
High turnover	_____	_____
Frequent lateness	_____	_____

6. What percentage of your employees arrive at work by automobile? _____
7. Indicate the number of jobs presently in your firm in the following categories:

	<u>Number</u>
Professional, managerial	_____
Sales	_____
Clerical	_____
Skilled - craftsmen, etc.	_____
Semi-skilled - operatives, etc.	_____
Unskilled - laborers	_____
Unskilled - service, maintenance, etc.	_____

8. Estimate under present and normal business conditions the number of job openings occurring in your firm during an average month in the following categories:

	<u>Present</u>	<u>Normal</u>	<u>Pay Range (\$ per wk.)</u>
Professional, managerial	_____	_____	_____
Sales	_____	_____	_____
Clerical	_____	_____	_____
Skilled - craftsmen, etc.	_____	_____	_____
Semi-skilled - operatives, etc.	_____	_____	_____
Unskilled - laborers	_____	_____	_____
Unskilled - service, maintenance, etc.	_____	_____	_____

9. Do you have an on-the-job training program for semi-skilled workers?

Yes _____ No _____

10. How do you compensate the trainee during the training program?

HOME INTERVIEW
TAD/RPA/SDA

Address _____

Interviewer _____

Apt. No. _____

Date _____

1. In your opinion, what are the major transportation problems in this neighborhood, including trips to work?

- | | | | |
|--------------------------|-------|-----------------------------|-------|
| a) Trip is O.K. | _____ | h) Not enough night service | _____ |
| b) Costs too much | _____ | i) Too crowded | _____ |
| c) Takes too long | _____ | j) Too dirty | _____ |
| d) Too much waiting | _____ | k) Unsafe | _____ |
| e) Too much transferring | _____ | l) No public transportation | _____ |
| f) Too much walking | _____ | m) Directions not clear | _____ |
| g) Unreliable | _____ | n) Other (specify) | _____ |

2. Do you own a car? Yes (1) No (2) How many? _____

3. Length of time at this address _____

4. How many persons are living here? _____

5. How many are 16 years or older? _____

6. For those 16 or older (oldest first)
(Check person interviewed)

Person No.	Sex		Age				Drivers License		Educational Status				Training School Grad.
	M (1)	F (2)	16-25 (1)	25-40 (2)	40-65 (3)	65+ (4)	Yes (1)	No (2)	Less than 8th (1)	Less than 12th (2)	H.S. Grad. (3)	Coll. Grad. (4)	
1.													
2.													
3.													
4.													

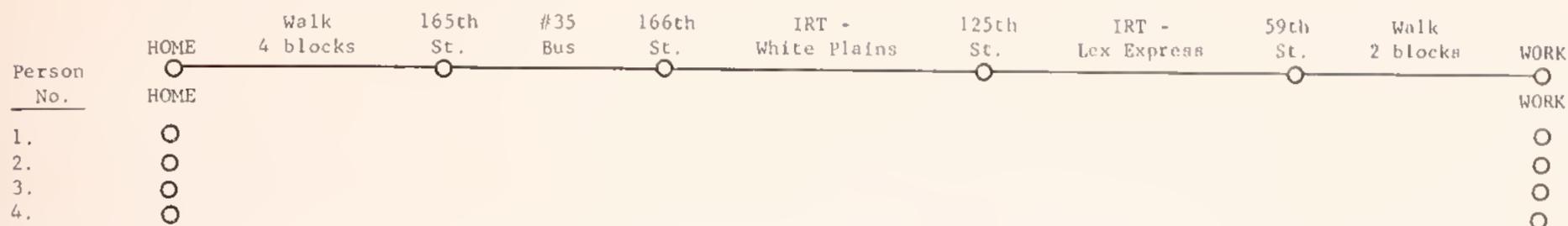
7. Who of the above have jobs right now?

Person No.	Yes (1)	No (2)	Receiving Unemployment Insurance Benefit (3)	Welfare (4)	Pension (5)
1.					
2.					
3.					
4.					

8. FOR THOSE WITH JOBS NOW, CONTINUE
FOR THOSE WHO DO NOT, GO TO PAGE 4

Person No.	Exact Location or Address of Job	Borough or Town	Occupation	Type of Business	How long there		
					0-1 (1)	1-2 (2)	2+ (3)
1.							
2.							
3.							
4.							

9. Please describe your usual trip to work including how far you walk, names of bus and subway lines used, where you get on and off, etc. For example,



10. Person No.

	Travel time (door to door)	Time due at work	Cost of trip
1.			
2.			
3.			
4.			

11. How much do you earn per week before taxes?

Person No.	Under \$50 (1)	\$50-70 (2)	\$70-100 (3)	\$100-150 (4)	\$150-200 (5)	\$200+ (6)
1.						
2.						
3.						
4.						

12. Do you know of any better paying jobs that you could get to if transportation were better?

Person No.	Yes	No	Where?	How much more per week?
1.				
2.				
3.				
4.				

13. What suggestions do you have for improving transportation services for your community?

FOR THOSE THAT DO NOT HAVE JOBS

1. Why are you out of work?

Person No.	In school	Look after family	Pay too low	Laid off	Not enough education/training	Poor Transportation	Discrimination	Other (specify)
1.								
2.								
3.								
4.								

2. How long are you out of work? 3. Location of last job 4. How much earned? 5. Have trade?

Person No.			5. Have trade?		
			Yes	No	What
1.					
2.					
3.					
4.					

3. Are you willing to enroll in a skills training program?

Person No.	Yes	No	If yes, what trade
1.			
2.			
3.			
4.			

4. What suggestions do you have for improving transportation services for your community?

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